

OS/2[®]

M A G A Z I N E

Reviews

Maple V Release 4
R:Base and R:Web
Scanner Utilities

Critically Acclaimed

The Case
for

OS/2 Warp

Page 20

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Plus

Intelligent Agents in Object REXX
Test Drives: A Sampling of Shareware



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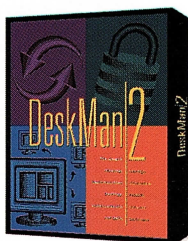
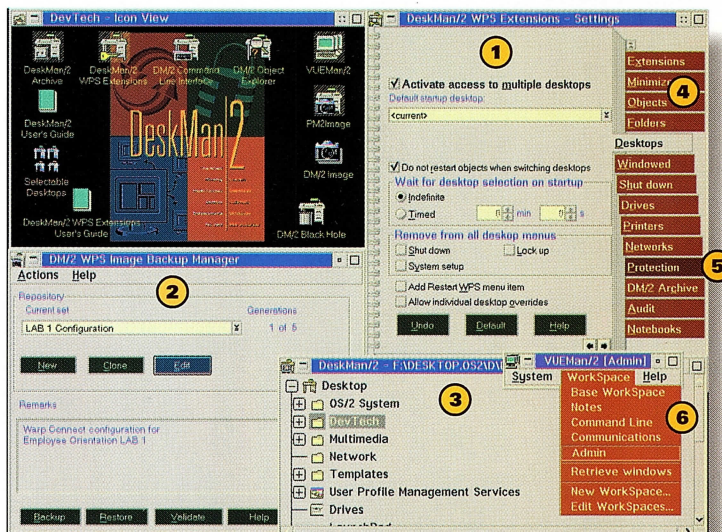
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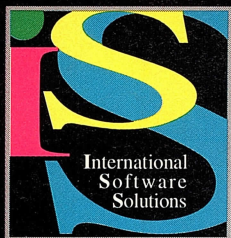


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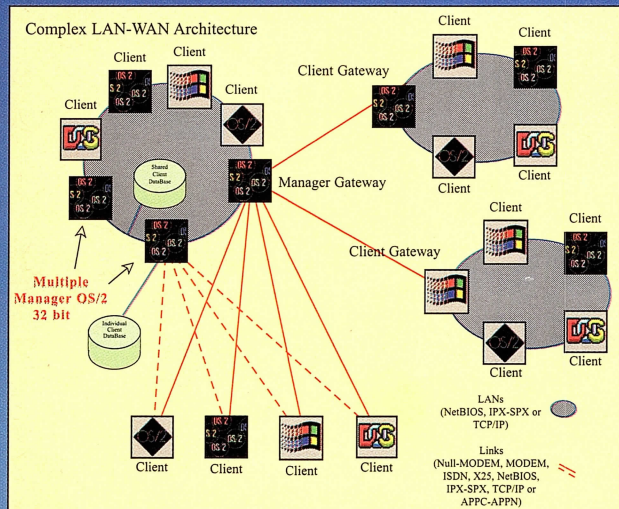
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OS/2 Professional October 1995
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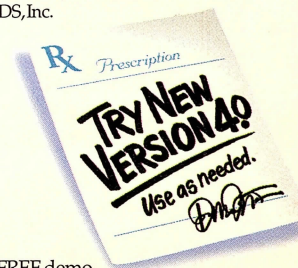
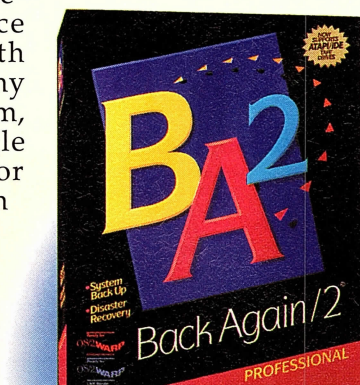
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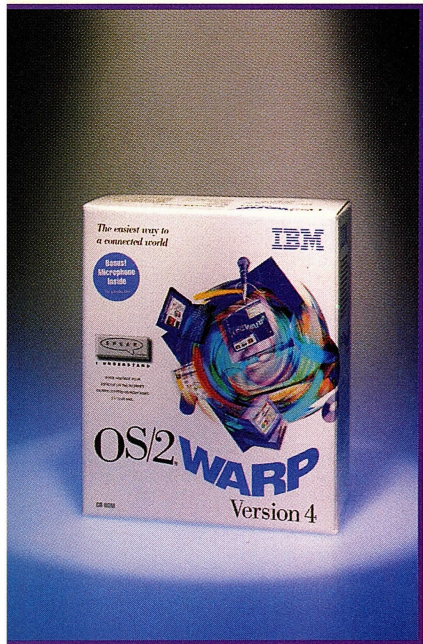


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OS/2 Warp's proponents often cite the operating system's technical superiority using terms like object-oriented and 32-bit. When IBM talks about OS/2, we hear its latest cross-platform strategy, essentially Java-enabled. But what are OS/2 Warp's tangible advantages for you and your enterprise? Let's look at OS/2 Warp's compelling benefits on the workstation: reliability, consistency, flexibility, connectivity, affordability, and more. (This is the story that we wish IBM would tell.) *By Esther Schindler*

27 The Scanning Story

No desktop operating system does a good job supporting scanners. Despite the TWAIN interface standard, scanning is left to a hodgepodge of incompatible hardware, interface cards, device drivers, and applications. Determined to make page-scanning work, however, our intrepid reporter tackled HP's ScanJet 4C and the necessary accessories. *By J.C. Love*

30 Advanced Game Design with OS/2

Many of today's most popular computer games are built on high-speed, high-resolution graphics—and that's why DOS games, which can bypass the operating system to interact directly with graphics hardware, are so popular. But thanks to the GPI graphics library, built into OS/2 Warp, you can develop graphics-intensive games that offer all the performance that players demand.

By Michael Ramsey

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Intelligent agents are programs that travel through a network, performing useful tasks for users or for the system itself. But the technology itself adds no value—success will require new applications that use agents. Here's how you can begin utilizing intelligent agents using Object REXX, a new resource included with OS/2 Warp 4.0. *By Michael Barylka, Gary Cole, and Paul Everett*

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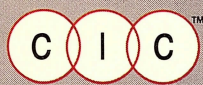
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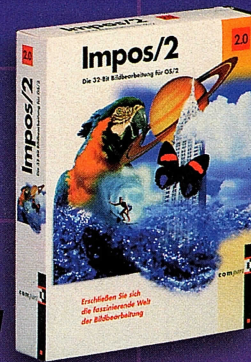
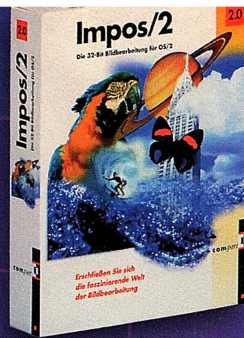
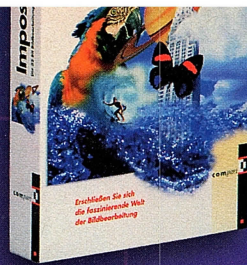
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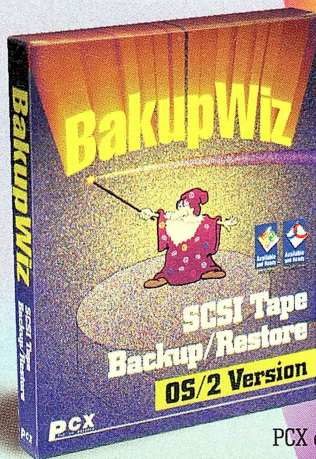
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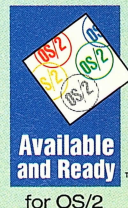
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Perspectives

Changing Dynamics

My friends, this is the final issue of *OS/2 Magazine*.

As you undoubtedly know, the OS/2 market has had its constant uncertainty. Not with OS/2 users—your loyalty is legendary. Rather, the uncertainty comes within IBM itself, and from there to its third-party hardware and software community. Plus, of course, the press and the analysts—people who don't use OS/2, but who have an opinion and an audience.

Back in early 1993, when we first looked at the opportunities that an OS/2 magazine presented to the OS/2 community—readers, vendors, and IBM alike—the market looked very different than it does today. OS/2 2.0 was hot, and Windows 3.11 seemed stalled. Independent market analysts had projected healthy growth in OS/2's installed base. There were lots of new books, and three periodicals, *OS/2 Monthly*, *OS/2 Professional*, and our own *OS/2 Developer*.

What's more, there appeared to be a critical mass of independent software, hardware, and peripheral marketers who would collectively commit the level of advertising dollars needed to produce our magazine. (Your subscription price barely covers the cost of printing and mailing the copies that show up on your desk.)

So we launched *OS/2 Magazine*, with the first issue appearing at the 1993 Fall Comdex. All systems were go: At that trade show, we were thrilled that OS/2 had such a visible presence, and we left the show feeling quite optimistic about the success of our newest magazine.

In 1994 the winds shifted. IBM's support for third-party vendors lulled, leaving the market becalmed. A few large software makers, like WordPerfect, pulled the plug on OS/2, and this sent shock-waves through the development community. Many developers scuttled or downsized their OS/2 plans and listened more closely to Microsoft's Olympian pronouncements about Chicago and Cairo. Even those companies with viable OS/2 software were hesitant to invest in marketing.

Hardware manufacturers, too, chose not to promote their wares to OS/2 users, despite IBM's occasionally active evangelism. Few peripheral manufacturers wrote OS/2 drivers, and even fewer PC systems vendors preloaded OS/2 or offered technical support for the operating system.

As 1994 turned into 1995, it seemed that the entire world held its breath waiting for Chicago. Despite the considerable investment that IBM poured into OS/2 Warp 3.0, most hardware and software makers preferred to save their development and pro-

motion budgets for Microsoft's vaporware operating system, rather than capitalizing on IBM's offering—which did everything Microsoft claimed for Windows. Only sooner. And better.

IBM's purchase of Lotus Development Corp. didn't help. Some smaller entrepreneurs, who had competed against Lotus, chose not to compete against IBM's resources and walked away. That's too bad, because the IBM Lotus Division has never kept its OS/2 promises, and probably never will.

Over the past year, things continued to worsen. We had hoped that once Windows 95 shipped, more independent software and hardware developers would see the promise of the OS/2 market. They didn't. We hoped that IBM would rally behind OS/2. It didn't. Instead, Big Blue's top executives embraced Lotus's "operating-system agnostic" stance and lined up behind Windows 95/NT.

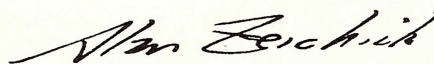
What about the launch of OS/2 Warp 4.0? IBM positioned Merlin as an upgrade option for dedicated OS/2 Warp Connect users and is barely marketing OS/2-specific solutions. Following IBM's lead, very few third-party providers are planning special support or marketing programs around Merlin. And advertising contributes nearly all of *OS/2 Magazine's* operating revenue.

That's where we stand today: The dynamics of the OS/2 market simply don't allow *OS/2 Magazine* to continue being published—not unless we raised our cover price to around \$15 per month and could count on all of you to maintain your subscriptions. That's not a realistic scenario.

That's *not* to say that OS/2 itself is dead. Far from it. I honestly believe that IBM is committed to supporting enterprise OS/2 customers for many years to come. And many, many users will remain loyal to their chosen operating system—myself included. The reality is that the OS/2 market simply can't support a dedicated, independent print publication.

I'd like to thank all of you, readers, writers, and contributing editors—everyone who has supported us for the past three years. And please help me give special thanks for the hard-working staff of *OS/2 Magazine*, past and present. We would never have made it this far without them.

Take care,

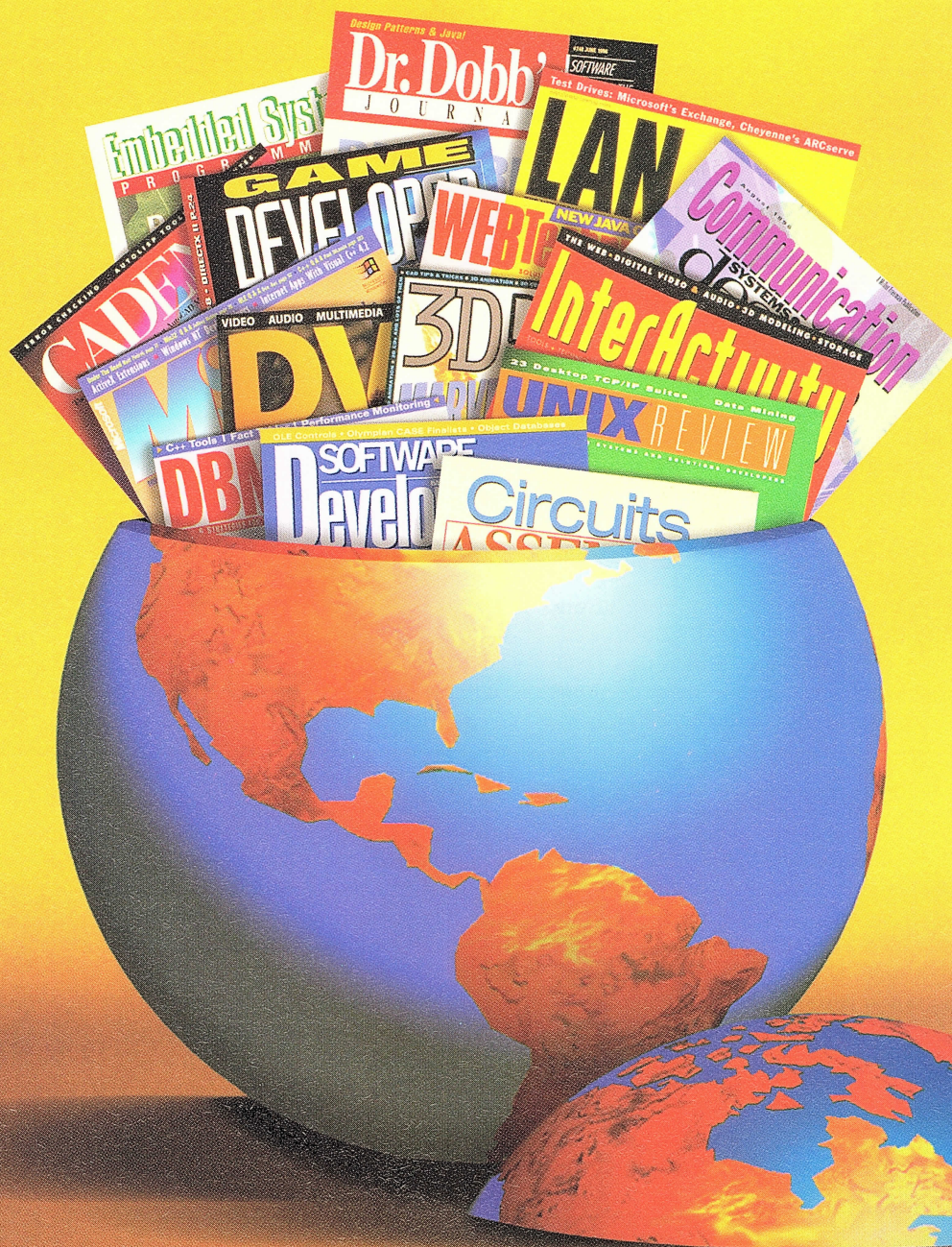


Alan Zeichick
Editor-in-Chief



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Letters

It is legal for littleDog to declare bark with the same signature as dog's.

AntiVirus 2.5 and OS/2 Warp 4.0

Dear Editor,

I agree with Brian Proffitt's review of AntiVirus 2.5 (November 1996, pp. 42-44). I use the Enterprise Edition to protect the network I manage. However, I feel your readers should be aware of a bug in version 2.5 that causes a SYS3171 error when run under OS/2 Warp 4.0.

The SYS3171 occurs after installation and before the automated scans. Even though the error occurs, the scans still seem to function, and manual scans are not affected. Running AntiVirus under OS/2 Warp 3.0 or OS/2 Warp Connect does not reveal the bug. IBM AntiVirus support says they know this is a problem, and it will be promptly fixed in release 2.5.1, due out next month.

Christopher Pratt
IBM Certified OS/2 Engineer,
Team OS/2

Virtual functions in C++

Dear Editor,

In "A Kilometer Is Not a Kilometer" (September 1996, pp. 42-46), Roger Sessions states that C++ classes MUST have virtual methods, so derived classes can override them. This is not true, however. Derived classes can override ANY public or protected nonstatic function. Virtual functions are useful in a much different way, dealing with dynamic binding and generosity.

Richard Smol

Your assertion that a derived class can override a nonvirtual method is wrong. I covered this topic in my article "Polymorphism, Frameworks, and littleDogs" (February 1996, pp. 46-50), but let me give you a brief proof here.

Consider the following code:

```
#include <iostream.h>
class dog {
public:
```

```
    void print();
    void bark();
};

class littleDog : public dog {
public:
    void bark();
};

void dog::print()
{
    cout << "Dog says " << endl;
    bark();
}

void dog::bark()
{
    cout << "Generic dog noise" << endl;
}

void littleDog::bark()
{
    cout << "woof woof" << endl;
}

main(int argc, char *argv[],
char *envp[])
{
    dog Snoopy;
    littleDog Toto;
    Snoopy.print();
    Toto.print();
}
```

Notice the main program instantiates a littleDog (Toto), which invokes dog::print, which invokes dog(?)::bark. The dog(?)::bark method should be polymorphically resolved. The desired output from this program is:

```
Dog says
Generic dog noise
Dog says
woof woof
```

The string, **Generic dog noise**, comes from asking a dog (Snoopy) to print himself, and the string, **woof woof**, comes from asking a littleDog (Toto) to print himself.

There are four possible cases:

1. dog::bark is virtual, littleDog bark isn't.
2. dog::bark isn't virtual, littleDog bark is too.
3. dog::bark isn't virtual, littleDog bark is.
4. dog::bark is virtual, littleDog bark is too.

Neither case 2 nor 3 give the desired output. Both 1 and 4 do. However, when a base class declares a method virtual, that method is virtual for all derived classes. Therefore, case 4 is the same as case 1. Your assertion is that case 3 gives the desired output. It doesn't.

It is legal for littleDog to declare bark with the same signature as dog's. However this is NOT an override; this is an overload—two very different things.

Roger Sessions

Recommended reading?

Dear Editor,

Roger Sessions' column, "Ten Rules for Distributed Object Systems" (October 1996, pp34-37), could not have been better timed! I am just getting involved in a CORBA-based project and need some examples of how others have designed their distributed objects.

Got any books or papers I could read?

Thanks,

Cliff Hayden

I'm afraid there isn't much published about how people have designed their distributed systems. The OMG Web site includes numerous abstracts of distributed applications, but there isn't enough information to figure out what they actually did. You could check my Web site for many references to papers and books on distributed applications, but very few case studies exist. Maybe I'll try to do a column on this topic someday.

Roger Sessions

Signs of The Times

BY ALAN ZEICHICK

Two weeks after OS/2 Warp 4.0's launch in late September, we heard about a reorganization within IBM's Personal Software Products division. PSP, as you probably know, is the group that "owns" OS/2 Warp itself, and is one of the major divisions within IBM's all-encompassing Software Group.

At large companies, like the International Business Machines Corporation, reorganizations are often ways for executives to look busy, while accomplishing little of value to customers—or adding to the bottom line. In this case, however, these changes look good for the OS/2 community.

In a nutshell, PSP is reinventing itself to exploit the coming trend of network computing. Unlike the client/server phase, where you ran a software core on the server (like a DB2 engine) and then a customized front-end application on the desktop (like a REXX program that accessed the database), "network computing" has *everything* residing on servers. You might still have DB2 running on a mainframe, but that mainframe might be connected to a private-access Web server (on a so-called "intranet"). All you'd need on the end-user workstation would be the tools to access that intranet server. The most popular tools are Web browsers like IBM's Web Explorer, Netscape's Navigator, and Microsoft's Internet Explorer.

What does that have to do with IBM's Personal Software Products group? Well, IBM is betting that the network-computing paradigm will succeed and will replace the client/server paradigm. Therefore, it's split-

ting its efforts into three "business-line" groups, each designed to the way a large group of customers would deploy network computing:

- The first group will concentrate on what IBM calls the "base OS/2 business." This group will continue to build and enhance OS/2 Warp and OS/2 Warp Server, with the goal of actively helping IBM's existing OS/2 customers transfer from the client/server model to network-computing model.
- The second group will focus on "embedding" OS/2 into special-

ized applications areas, such as within automated teller machines. You'd expect this group to be working closely with really large customers or business partners and to offer very customized solutions.

- The third group, and potentially the most important one, will be building marketable network-computing solutions. This group will be the team that should help port key software over to OS/2, such as IBM's net.commerce transaction server and Lotus's Domino intranet server.

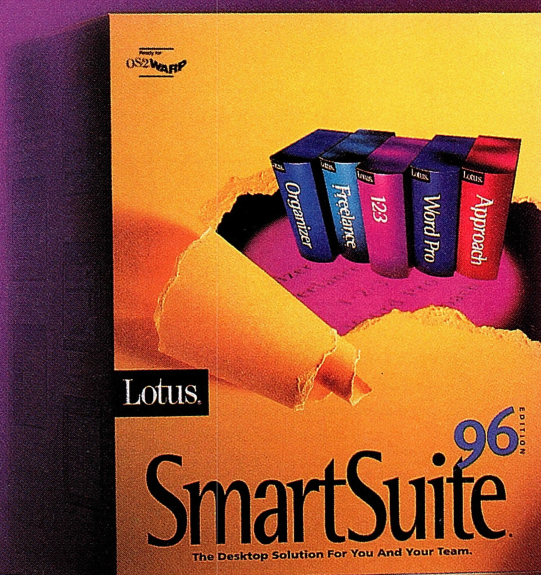
OS/2 APPLICATIONS TOP 15 LIST—OCTOBER 1996

This Month's Rank	Last Month's Rank	Product	Company
1	2	Object Desktop 1.5	Stardock Systems
2	3	Partition Magic 2 Personal Ed.	PowerQuest
3	-	TrueSpectra Photo>Graphics 1.0	TrueSpectra
4	3	IBM AntiVirus Desktop Ed.	IBM
5	4	System Commander 2.2	V Communications
6	12	Hobbes CD-ROM Archive	Walnut Creek
7	6	UniMaint 5.0	SofTouch Systems
8	7	BackAgain/2 4.0 Prof. Ed.	Comp Data Strategies
9	-	QuickMotion 1.1	Practice Corp.
10	9	DeScribe Voyager Plus CD	DeScribe
11	15	Seagate Backup 2 Personal Ed.	Seagate
12	12	BackMaster 2.0	MSR Development
13	-	SofTouch Suite	SofTouch Systems
14 (tie)	12	GammaTech Utilities 3.0	SofTouch Systems
14 (tie)	-	FileStar/2 2.0	SofTouch Systems
15	-	DeskMan/2 1.51 Corp. Ed.	Dev Technologies

Since OS/2 Warp and OS/2 Warp Connect are consistently ranked as top-selling products, and sales of additional licenses can sometimes skew results, this list has been modified to highlight only the top-selling OS/2 applications. (Best-seller information courtesy of Indelible Blue.)

Introducing Lotus' new desktop suite designed for OS/2 Warp, Lotus SmartSuite.® Optimized for both individual and workgroup productivity, SmartSuite 96 offers five leading applications to help you get work done. Sound like something you could use? Well now you can. New OS/2 versions of Word Pro and Freelance Graphics help you get connected with easy Internet access and breakthrough team computing features. And, since our OS/2 versions of 1-2-3®, Approach® and Organizer® are still in development,

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one thing left to say
to OS/2 users
looking for a suite.**



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this came from.**

we're offering an interim solution. Get the two native applications now, along with the rest in Win 3.1 format (for use under Win-OS/2). Then, in '97, we'll upgrade you to the complete suite of native OS/2 applications, including ScreenCam®, for FREE.* Lotus SmartSuite is the answer to your needs today. And in the future. For more information about SmartSuite for OS/2, call 1-800-872-3387, ext. C753. Or explore Lotus on the World Wide Web at www.lotus.com.

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The goal, says Donn Atkins, vice-president of marketing for PSP, is to more easily understand market requirements, build products faster, and get them to market more quickly. He stresses that OS/2 is at the center of all three groups, although he says that they're free to develop solutions on other platforms. His mission includes working closely with other IBM groups; with Domino, for example, Lotus will continue to own the product, and Mr. Atkins' "network-computing" group will help Lotus build and market the OS/2 version.

Mr. Atkins admits that PSP's OS/2 efforts are primarily geared at supporting existing corporate OS/2 customers, not on expanding OS/2's penetration. He did say, however, that opportunities do exist to expand OS/2's presence in smaller and medium-sized enterprises, largely because of IBM's decreased reliance on its traditional sales and marketing methods and an increased use of its BESTeam value-added resellers.

When we talked to Mr. Atkins, we heard the genuine excitement for this new organization: "I want to get a drumbeat going! You're going to see us deliver [OS/2-based] products in a Web-year time-frame." To *OS/2 Magazine's* readers, he had a special message: "OS/2 is a good business, and our customers and partners can be confident that it's a good place to make their investment."

Puzzling over the NY Times

The *New York Times*—arguably one of the best newspapers in the world, but also well-known for being extremely critical about IBM and OS/2—has added native OS/2 software support for its online daily crossword puzzles.

The puzzles, accessible at <http://www.nytimes.com/partners/xword>, can be completed using Across Lite, developed by Literate Software Systems Inc. and adopted by the *Times* in October 1996; Across Lite is available

for OS/2, Windows 3.x/95/NT, Macintosh, and several flavors of UNIX. Although the *New York Times* interactive puzzle forum contains many complaints that Across Lite is slow and clumsy (so is the *Times'* Web-based forum software, by the way), we applaud the *Times* for embracing a cross-platform solution.

Access to the *New York Times* Web site is free, after registration at <http://www.nytimes.com>. Support for the free Across Lite software is available at <http://www.litsoft.com>.

DeScribe goes into liquidation

On October 1, 1996, DeScribe Inc. went into liquidation. One of the oldest and best-known OS/2 independent software vendors, the company had two products, DeScribe, a network-enabled word processor, and Voyager, a version designed for personal use.

For the past several years, the OS/2 community has had a love/hate relationship with DeScribe, due largely to the who-cares-what-our-customers-think attitude displayed by its top management, in particular, founder James Lennane. In an attempt to turn the business around, DeScribe brought in an outside manager last May. Apparently, that effort has been abandoned; according to DeScribe officials, the market opportunities for third-party word processing software is too limited.

Well, actually, it's not just word processing software they're giving up on: "It no longer seems possible to remain an ISV in the market for OS/2 productivity applications. Price deterioration and control of the market by the operating-system vendors leaves no room for the independent operator," read its press release, which added that DeScribe never enjoyed a profitable quarter since its beginnings in 1989.

DeScribe will make a full refund for most software purchased during September 1996; see <http://www.describe.com> for details. The company intends to ship all back-ordered products; its remaining inventory will continue to be sold, but there will be no DeScribe end-user or technical support.

OS/2

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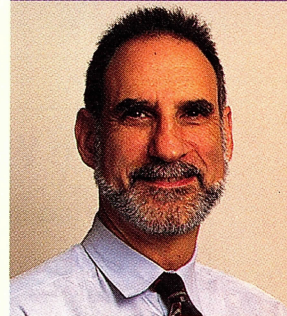
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Major Features of ATS for OS/2:

- ☺ Manage production job streams.
- ☺ Programs can be scheduled to run any time.
- ☺ Programs can be dependent upon files, other programs, holiday schedules and external signals.
- ☺ Integrated operations console.
- ☺ Logging - to file and console.
- ☺ Job Queues for managing your resources while managing your tasks.
- ☺ Periodic Scheduling.
- ☺ Complete API and Command Line Interface.
- ☺ Restart Capabilities.

The OS/2 Biz: What Color is Your OS?

BY ALAN S. KAY



If you're looking as the new year turns for a bit of prognostication about the enterprise future of OS/2, you could do worse than turn your eyes westward, toward the magnificent fog funnel that is the Golden Gate. Just 25 miles to the north, in Novato, off historic Highway 101, you'll find the Fireman's Fund Insurance Co.

Fireman's Fund, an \$11 billion property and casualty insurer, is 134 years old. Its roots extend across the Bay to San Francisco, where it was founded with a sea captain at the helm and a charge to deliver 10% of its profits to the widows and orphans of firefighters. It paid off in the Great Chicago Fire, survived the 1906 earthquake, and has continued to prosper.

Fireman's Fund is also one of the biggest OS/2 shops in the country. Its Workstation Engineering Services Dept. oversees an installed base that, by year's end, should number about 8,000 OS/2 desktops. They're connected by more than 200 servers running LAN Server, wide area connectivity via an SNA network using T-1s, and soon Frame Relay and TCP/IP.

Fireman's Fund goes way back with OS/2—back to version 1.1, in fact. Wil Kimura, a systems programming specialist, smiles as he gestures toward a cabinet. "I still have some OS/2 disks with Microsoft on them—that's how far back we go."

Back in 1987, when Virgil Pittman first went to work at the Fund, all the data that was used to price risks and settle claims was crunched on an IBM 370 mainframe. Pittman introduced client/server computing, working at first in DOS to create a functional PC

client. Two years later, however, with the release of the venerable OS/2 1.3, Pittman discovered a robust software package that would provide database access while supporting communications and an accessible user interface.

Some of that 1.3 code is still running at the Fund, Kimura acknowledges, but the IT infrastructure has moved on. The standard desktop configuration is OS/2 2.11, but his department began deploying OS/2 Warp Connect early in 1996. It's gone slower than it might have because of a decision that desktop hard disks needed to be repartitioned to accommodate the addition of TCP/IP and NetFinity as well.

The Fund is not only upgrading, it's proliferating OS/2. OS/2 is scheduled to be installed at a number of remote claims sites. But it's IBM's new products that have Kimura excited. "I like Merlin a lot. I like the new user interface, and the WarpCenter is easier to get to than the old Launchpad; its size makes it reasonable."

Then there's Java. "I read the Java-enabled Merlin as a big message: IBM is betting that Java applications will become as prevalent as Windows applications." If current market trends are any indications, it's one of the safest bets IBM has made in years.

Pittman committed the Fund's IT infrastructure early on to a relatively new groupware technology named Notes—not so coincidentally because the Notes server ran under OS/2. Today Lotus Notes is an IBM product, and with the new Domino server, Lotus is racing toward the Internet as well. Kimura's chief quibble with IBM and OS/2 is with one of the legacies of

the messy 1991 divorce between IBM and Microsoft: Warp's inability to run Win32 applications natively. "The place it's hurt us is in Lotus's delays in rolling out the various versions of the SmartSuite for OS/2. After all, the NT version is already out, and our users want its functionality."

Pittman is now retiring after 10 years as Fireman's Fund's CIO. With the OS/2 champion's departure, what will happen to the Fund's commitment to OS/2? It is, after all, not that easy to stay committed to a system in which relatively few new applications are being written for it and that barely makes the industries' newswires. In fact, Kimura acknowledges that, in addition to its 8,000 OS/2 users, 40 or 50 employees are doing their work in a—are you ready for this?—Windows NT environment!

But Fireman's Fund has been all over the literature as an example of OS/2's success in the enterprise. Pittman is featured prominently in OS/2 literature, praising OS/2 for its application support.

So what does the future hold? Will the Fund remain True Blue? Will it grow toward a heterogeneous desktop environment, or will it join the move to the new industrial strength Windows? Keep your eyes focused on the sun setting in the west; the color that flashes just as it sets may well tell the tale.

OS/2

Alan S. Kay, a veteran business and technology journalist, covers the OS/2 business world from Washington, D.C. and San Francisco. You can reach him on the Internet at ask@well.com.

Just Announced

Secure Workplace 4.10

Enterprise desktop management

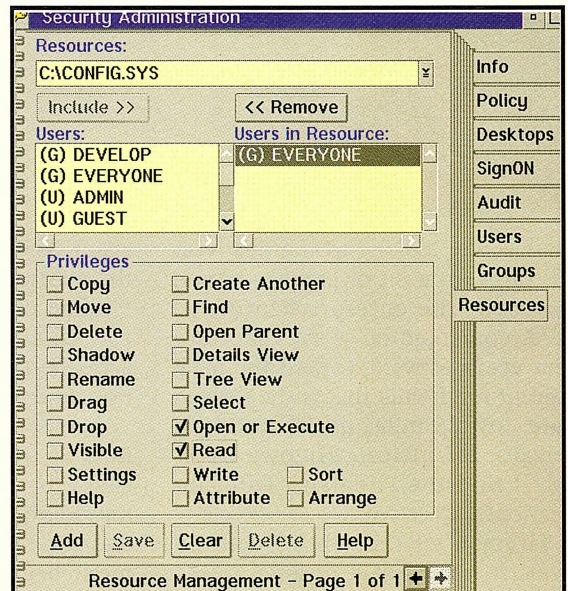
Syntegration Inc. has announced Secure Workplace 4.10, professional edition, which offers C2-level security for the OS/2 workstation.

Secure Workplace works as an Installable Security System (ISS), plugging into OS/2's Security Enabling Services (SES) and allowing administrators to enforce file access control permissions on either a user or group basis. Secure Workplace not only enforces file security but also offers multiple desktop management, single sign-on to local networks, an audit-trail viewer, and a more secure screen saver than what ships with OS/2 Warp. It also disables the <Ctrl-Alt-Del> and <Alt-F1> key combinations and offers the ability to remove the Shutdown command from right-click menus and other locations. Secure Workplace, professional edition, requires OS/2 Warp 3.0 with FixPak 17 or later, or OS/2 Warp 4.0; SES must be installed before installing Secure Workplace. This version is priced at \$120 for new licenses, or \$45 for upgrades.

The Secure Workplace 4.10, standard edition, offers many of the same features, but does not include the SES access control driver, security event auditing, a multiple desktop manager, and disabling of <Ctrl-Alt-Del>. The standard edition is compatible with OS/2 2.11 or later and is priced at \$79.95 for new licenses, \$29.95 for upgrades.

Syntegration Inc., (909) 464-9450, fax (909) 627-3541, e-mail 73707.3331@compuserve.com, or see its Web site at <http://www.primenet.com/~syntegrn>.

READER SERVICE NO. 102



Linear Executable Optimizer 1.21

Code-tuning utility

Functional Software Ltd. has announced the Linear Executable Optimizer (LXOPT) 1.21, an assembler-level code tuner designed to reduce an application's memory requirements.

LXOPT recompiles existing executable files (OS/2 .exe), generating new code arrangements designed to minimize application paging. LXOPT tracks the application's code use at run time and uses that profile to allocate each processor instruction to its optimal memory page. According to the developers, the total code-page load is typically reduced by 50%, and paging in low-memory conditions can be reduced by as much as 95%.

Note that .exe files will normally require relinking.

The latest version also optimizes code-loading-related disk access and CPU instruction caches. The software includes utilities that apply or remove .exe or .dll file page compression (exepack), as well as an executable preloader to reduce application startup time.

LXOPT 1.21 requires OS/2 2.0 or later; FixPak 11 is recommended for OS/2 Warp 3.0. The price is US\$195, or UK£125. A free evaluation version, restricted to processing only 256kB of executable code, can be downloaded from <ftp://ftp-os2.cdrom.com/pub/os2/demos/lxopt121.zip> or from CompuServe's OS2DF1 forum, "Development Tools" section, as lxopt121.zip.

Functional Software Ltd., fax +44 1638-714742, e-mail 100325.3650@compuserve.com or funcsoft@cix.compu

link.co.uk. In the U.S., LXOPT is available from BMT Micro, (800) 414-4268 or (910) 791-7052, fax (910) 350-2937, e-mail bmt@wilmington.net, or see BMT Micro's Web site at <http://www.wilmington.net/bmtmicro>.

READER SERVICE NO. 103

InCharge 1.02.20

Personal, small-business financial system

Spitfire Software Inc. has announced InCharge 1.02.20, which adds more than 100 enhancements to the previous version, 1.02.00. InCharge supports multiple sets of books, and within a set of books tracks assets and liabilities in any currency, handling currency conversion automatically when moving funds between different ac-

counts. The software accommodates multiple-year budgets, accounts payable/receivable, property, securities, insurance, and tax data. Built-in report formats for invoicing, order entry, inventory, and sales analysis are provided. InCharge can print checks immediately or queue them for batch printing, or pay bills via CheckFree.

The latest version of InCharge adds pop-up menus on dialog boxes, algebraic and RPN calculators, graphical reports, multiple property inventories, liquidity and stock activity reports, stock quote retrieval from the Internet, new capabilities for customized reporting functions, and many other usability enhancements. InCharge 1.02.20 is priced at \$79 for new users; registered owners can upgrade for \$20.

Spitfire Software Inc., (404) 257-0187, fax (404) 255-8032, e-mail landeck@onramp.net, or see its Web site at <http://www.rampages.onramp.net/~landeck>.

READER SERVICE NO. 104

Validator 2a and Designer 5a

Application development utilities

Prominare Inc. has announced upgrades to two development tools, Validator 2a and Designer 5a.

Validator 2a helps applications developers monitor errors as they occur within an application both on a parameter-by-parameter basis and on a return basis, comparing every parameter against the OS/2 Technical Reference definition. When an error is detected, Validator reports the source module and line number where the problem occurred. Validator supports APIs for OS/2 2.x, OS/2 Warp 3.x, and now OS/2 Warp 4.0, as well as Pen for OS/2, MMPM/2, Dive, and BIDI.

The new release offers reduced memory requirements, enhanced full-

screen support, and monitoring of memory leakage, plus a new utility, called ViewPort, with which the developer can watch the validation error information in real time.

Validator 2a has been licensed by IBM Corp. to be included on future toolkits, and a beta version is on the IBM Developer Connection CD-ROM. The shipping version is available for \$99, and the upgrade price is \$49.

Designer 5a is an OS/2 Presentation Manager-based tool for creating graphical user interfaces (GUIs) for OS/2, Windows 3.x, and Windows NT, including the source code. Designer can port resources from OS/2 to or from Windows. (A stripped-down version,

without the code generator, is called Universal Resource Editor and is currently in beta on the OS/2 Warp 4.0 developer toolkit.)

As a resource editor, Designer 5a supports all versions of OS/2, from 1.x forward, including the ability to work with custom control and PM Control Extensions (PMCX); it also supports MMPM/2 and Pen for OS/2 PM controls. Designer 5a is available for \$199 or as an upgrade for \$119; competitive upgrades are priced at \$139.

Prominare Inc., (416) 363-2292, fax (416) 363-6157, e-mail query@prominare.com, or see its Web site at <http://www.prominare.com/prominare>.

READER SERVICE NO. 105

OS/2

Just Announced OS/2 Internet Sites

John Summerfield's Tips

<http://iinet.net.au/~summer/>

Pages of tips from John Summerfield's experiences as an OS/2 user.

Jeff Shultz's OS/2 Links

<http://www.netcom.com/~jbshultz>

Check out this new site full of links!

Fernando Cassia's HP CD-Writer FAQ

<http://ourworld.compuserve.com/homepages/fcassia/hpcdras2.htm>

Do you own or want to buy a write-able CD-Rom drive? Check out this FAQ for info on Fernando Cassia's experiences, including updated drivers.

CDP/2's OS/2 Review

<http://ourworld.compuserve.com/homepages/cpratt/>

Reviews by Christopher Pratt on several popular OS/2 applications.

Vancouver OS/2 SIG

<http://www.lionsgate.com/VanOS2/>

All the latest about what is going on with regard to OS/2 in Vancouver, B.C.

Tyler's OS/2 Links Page

<http://www.intersurf.com/~mardi123/os2page.html>

Yet another page of useful OS/2 links.

UPDATED

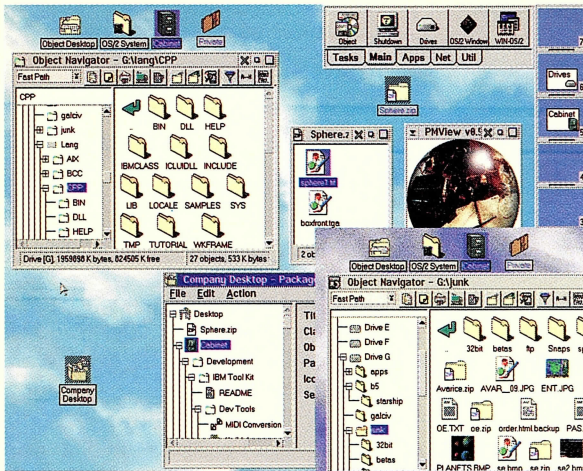
The Best of OS/2

<http://www.aescon.com/bestofos2/>

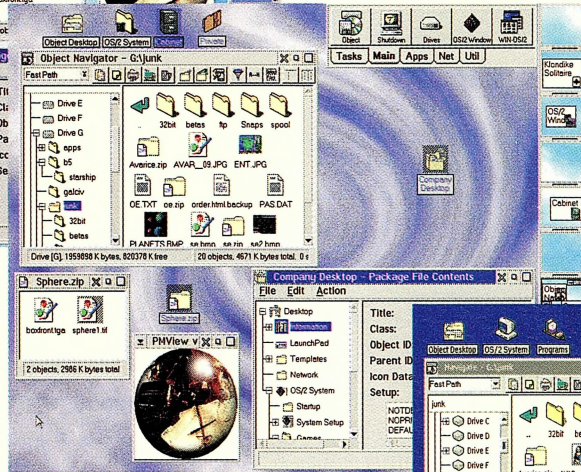
Completely updated with exciting new offerings and vendor product announcements.

(Information provided courtesy of Vicci Conway, vicci@ibm.net.)

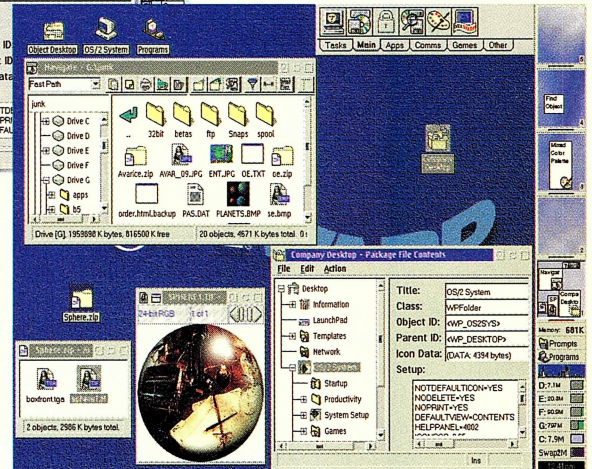
Take OS/2 To A New Level...



Object Desktop on OS/2 2.11



Object Desktop on OS/2 Warp 3.0



Object Desktop on OS/2 Warp 4.0 ("Merlin")

with

Object Desktop 1.5

The Next Generation Desktop Environment

Whether you're running OS/2 2.11, OS/2 Warp, or OS/2 "Merlin", Object Desktop takes OS/2 to a new level of power, ease of use, and performance.

That's because Object Desktop leverages the power of IBM's SOM technology -- it inherits all the features of OS/2 and then seamlessly adds new features to the base OS, making Object Desktop a compelling way to enhance your OS/2 system -- no matter which version of OS/2 you are using.

Much wanted features such as the ability to view/edit/run files in a .ZIP file, standardizing and distributing a desktop, virtual desktops, launching programs with a keyboard combination, and hundreds of other features not found in OS/2 itself are in Object Desktop and become part of OS/2 once Object Desktop is installed.

Make sure you're getting the most out of OS/2. Get Object Desktop and take OS/2 to a whole new level....

"Object Desktop brings the OS/2 desktop up to its potential and, in doing so, brings it up to date. And it does it so well, I predict it will be an instant hit and best-seller for OS/2 for a long time. No one who sees it will want to do without it."

-InfoWorld.

"Object Desktop makes OS/2 look and feel like a new version."

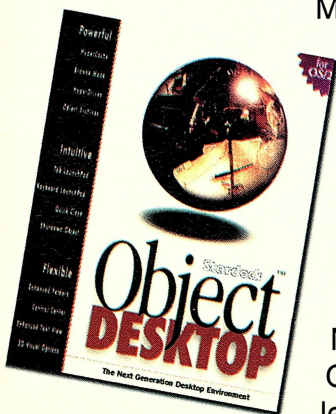
-PC Magazine

"With the fine reputation Stardock has developed for OS/2 applications, I don't hesitate to recommend Object Desktop fully."

-OS/2 Magazine

"Object Desktop complements OS/2 so well that your immediate response is bound to be, 'That's the way a computer is supposed to work.' If you use OS/2, get Object Desktop. It's simply splendid."

-Computer Shopper



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DD Packs, Desktop Settings, and More

BY DAVID REICH

TIP 268

OS/2 WARP 4.0 DEVICE DRIVER

Q: I've heard good things about the Device Driver Pack (DD Pack) CD included with OS/2 Warp 4.0. It has a lot of drivers and device driver information that I can use even though I'm not using version 4.0 (yet). As an OS/2 Warp 3.0 user, how can I get a copy of the DD Pack? And what is happening with new drivers? Will the DD Pack be updated?

A: The DD Pack is designed to bridge the gap between the IBM-certified drivers on the OS/2 installation disks and some other drivers from vendors, as well as new drivers that may not make the shrink-wrapped package. Many customers had complained that drivers did not exist or that they could not be found. The DD Pack includes drivers as well as pointers to many vendors' BBS systems and Web sites where you can download the latest from the vendor.

In addition to the CD shipped with OS/2 Warp 4.0, the DD Pack information, drivers, and pointers reside on the World Wide Web, accessible to anyone, regardless of their OS/2 version. It is totally up to you to pick the right version of a driver for the version of OS/2 you are running, but the information and drivers are there. Just point your Web browser to <http://service.software.ibm.com/os2ddpak/index.htm>.

OS/2 Warp 4.0 users can also open up the Connections folder installed by the system, and in there, open the Web Sites folder and double left-click on OS/2 Related Web Pages. You will see the DD Pack online entry.

IBM intends to update the DD Pack online with new drivers and updated pointers to enable you to find the drivers you need.

TIP 269

CD INSTALL

Q: I have a laptop computer that can only have a disk drive or a CD-ROM drive in at once. I want to install OS/2 Warp 4.0 from a CD, but to do that, I have to boot from a disk and read the remainder of the files from the CD. How can I do this with my hardware configuration?

A: At this time, IBM has not shipped a mechanism for you to install from CD directly, when your system allows only a CD or disk at once. The only choice you have is to copy the images of the disks from the CD-ROM to your hard disk, then to use the program provided on the CD to create disks.

The disk images are located on the CD-ROM, in the \DISKIMGs\OS2\35 subdirectory, and the image program used to unpack each file to a disk is *image.exe*, located in the \DISKIMGs directory. You can create each disk with the command:

IMAGE diskettefilename A:

where *diskettefilename* is the disk image file, and A: is the disk drive letter. Note that you can't image directly from the CD for the same reason that you can't install from the CD. That is, you can't image to the disk drive if the CD drive is installed.

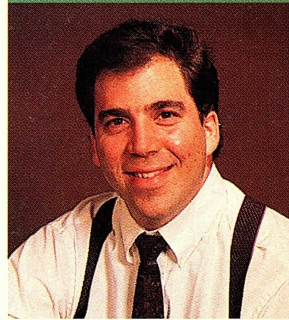
TIP 270

OS/2 AND MS APPLICATIONS

Q: We are currently running OS/2 Warp Server on our servers and want to install Microsoft applications (such as Project and Office) onto our servers so that users can access these from the server instead of loading these applications onto their PCs. I have called IBM, and as you stated in your column (Tip 261, November 1996), the current Win32S support is at version 1.25.

Do you know what level the Microsoft applications are at? Is IBM planning any upgrades soon to enable these applications to work? Do you know where we might purchase a product that will allow us to run Windows 95 applications on our OS/2 Warp Server platform? Or will we have to look for another server package?

A: As you correctly point out, OS/2 will currently support Win32S applications that require level 1.25 or prior. You need to realize, however, that many of the Microsoft applications



you are looking to use are not Win32S applications and require full-blown Win32 support.

Win32S, as the name implies, is a subset of the Win32 functions. Applications will state if they can survive with Win32S (and what version), or if they need a Win32 system such as Windows NT.

IBM has not made any statements about the further enhancements of Win32S support for OS/2. However, recently, IBM stated its direction for support of applications requiring Win32, such as the ones you need, on an OS/2 platform. That statement is the cooperation of an OS/2 system with the WinFrame product from Citrix Corp. WinFrame allows you to run the applications you need on a server and have OS/2 client systems. You can set up your network with a combination of file and application servers, as well as WinFrame clients running on OS/2 systems, thereby gaining the benefits of OS/2 while running the applications you need that may not run directly on OS/2 Warp Server.

TIP 271

DESKTOP SETTINGS

Q: I have been studying the OS/2 Workplace Shell classes in order to set up systems under program control because I have to administer many workstations. One class I have

yet to decipher is the desktop. In particular, I want to be able to set the background image under program control and to be able to customize it in other ways. Can you help me with some of the setup strings for the desktop?

A: The first thing you need to know is that the desktop is a folder, and an instance of the **wpFolder** class; it has special properties, of course, but is part of the **wpFolder** class. The desktop folder, just like any other folder, has a set of setup strings to which it responds, which is really the object of your query. The syntax of the **wpSetup** string for a folder (the desktop in this instance) for changing the background is shown in Listing 1.

An example of using the **BACKGROUND** keyname in the setup string for the folder is

```
BACKGROUND=D:\MYBITMAPS\
MYBMP.BMP,S,1,I
```

which says to use the bitmap file in D:\MYBITMAPS\MYBITMAP.BMP, set it to scaled at 1x1; the I is for IMAGE (as opposed to color). If you wanted a color, you could use

```
BACKGROUND=(none),,,C,
128 254 254"
```

Recall that this is just part of the overall setup string for a member of the **wpFolder** class. You can plug this into any of the programs you have that either create objects (folders in

this case) (see Tip 264, January 1996) or change the properties of folders through REXX, C, or whatever language in which you're writing.

TIP 272

UNATTENDED POPUPS

Q: Critical errors in OS/2 processed by the central error handler, or any action that results in a serious error, produce the system modal dialog box. As you know, this system error dialog has three choices:

- < > Return error code to program
- < > End program/command/operation
- < > Retry command or operation

When I leave my PC in unattended mode, and if such a message appears on screen, is there any way for me to let OS/2 close the offending session automatically without requiring human intervention? If this is possible, can I log the errors and later, at my leisure, analyze the error log?

A: I briefly discussed this problem a while back (September 1995). OS/2 has a facility to suppress pop-up messages for unattended systems such as yours.

Listing 1: Setup string syntax.

```
BACKGROUND = i,j,k,l,m
where i,j,k,l,m are:
i = ImageFileName
```

```
j = N|T|S
```

```
k = Scale-Count
```

```
l = I|C
```

```
m = Red-value Green-value Blue-value | DEFAULT
```

This is a fully qualified path of the image, or bitmap file. ImageFileName should always be fully qualified.

This is the image mode. The modes available are:

N = Normal

T = Tiled

S = Scaled

This is the scaling factor. 1 means 1x1, 2 means 2x2, and so on.

This specifies the background type.

I = Image

C = Color

This is the background color (if specifying color instead of image). You can either specify a set of 3 numbers separated by spaces representing the RGB values, or you can just specify "DEFAULT."

To enable this, edit your *config.sys* file and add a line such as

```
SUPPRESSPOPUPS = C
```

When you reboot, all popups will be stored in a file called *popuplog.os2* in the root directory of your C drive. You can substitute any valid drive letter. Also notice that there is no colon (":") after the drive letter in this statement that you might type in at a command prompt. This line in *config.sys* will allow you to capture pop-up information in unattended mode.

TIP 273

MULTIPLE WINDOWS

Q: I use to have two Windows directories. One directory was the "organized" Windows, and the other was where I tried new software, such as those I would download from the Internet. That way, I didn't clutter my "organized" Windows with junk, since most programs added something to the Windows' *.ini* files and often installed one or more *.dll* files.

I am now using OS/2 Warp 3.0, and I am wondering if there is a way to tell OS/2 to use a Windows directory for one Windows program and use another Windows directory for another Windows program that may be running concurrently. I am trying to do what I used to do when I had two Windows directories, but when I install OS/2 Win-OS2 support, OS/2 prompts me for my Windows directory, and I don't know if it allows you to do it twice. Is it possible to do what I want in OS/2?

A: Yes, but it is not simple. What you'll need to do is create separate configurations, each pointing to a different WIN-OS2 (Windows) setup and then create a separate set of WIN-OS2 objects.

Config.sys contains the pointers to your WIN-OS2 configuration, which is set up after you answer the ques-

tions asked during installation. The objects for each of your Windows programs, and the WIN-OS2 full screen and Window objects also point to this WIN-OS2 configuration. To do what you're asking, you will need to duplicate these objects, then modify them.

First, make a copy of the *config.sys* file. Next, edit that file and change all references from the WIN-OS2 directories to the other set of Windows you have. The next step is to copy the files from the first Windows configuration to the second one. The reason is because OS/2 adds some special files to the directories that make your Windows 3.x run as WIN-OS2 under OS/2.

Once you have the *config.sys* copy set up and the files copied, you need to create duplicates of the WIN-OS2 full screen and WIN-OS2 Window objects. Use the Copy option on the context menu (brought up by a right click on the object), and once the copy is made, use the right button again to bring up the context menu. With a left click, select Settings (Properties if you are on an OS/2 Warp 4.0 system).

Change the path and file name for each to point to the new copy you have made in the prior steps. Now you are ready to set up the configuration changes.

Several times in the past I have discussed setting up multiple *config.sys* files for different configurations using the archive options menu. Here is another opportunity to use it. Name one of the *config.sys* files *config.a*, and the other *config.b*. Put them into the \OS2\BOOT directory on the boot drive. Now go into the desktop settings (Properties if you are using OS/2 Warp 4.0) and choose the Archive tab. On that page, check the box that says to display the recovery choices at each startup. As a result, the menu will be displayed when you boot the system.

At this menu when you boot, you can hit either A or B, and that will boot with the appropriate *config* file you created. You can then use the appropriate set of WIN-OS2 objects and programs. This way, you can boot one way to use the "unorganized" WIN-OS2 configuration, and

the other way for the "organized" set of WIN-OS2.

Some issues to examine include making sure you use the right set of objects with the right *config* file boot. You could also do this with dynamic path modification and CMD files that modify the LIBPATH, but that would be a bit more involved and as you can see, this one is complicated enough.

TIP 274

FILE SIZES

Q: Files are getting larger these days and PCs have the horsepower to handle them. I'd appreciate it if you could shed some light on this issue. So, what's the deal on the 2GB file size limit in OS/2?

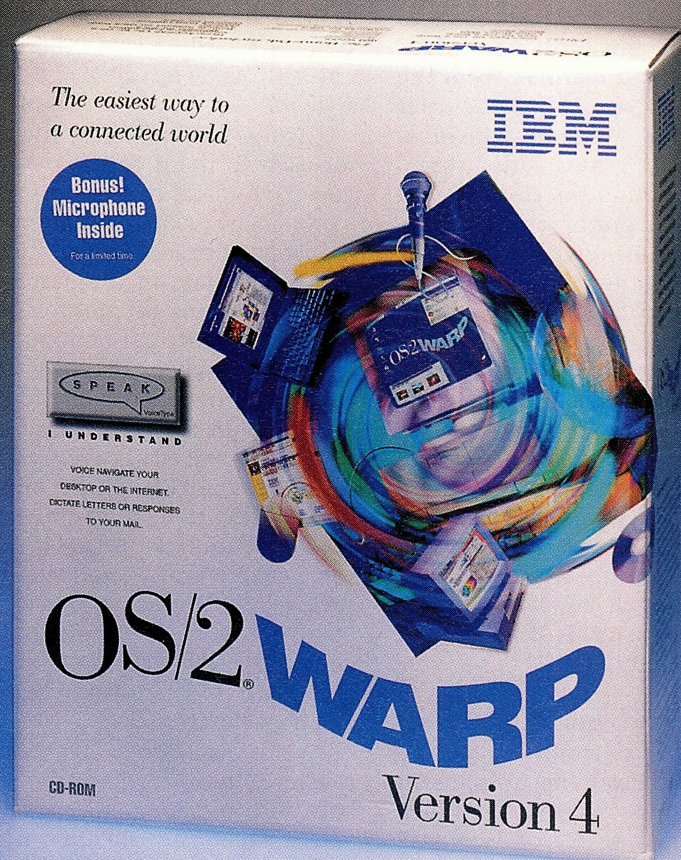
A: This question comes up periodically on various online forums and in letters I receive, so it's probably about time for another round of file size information.

Once again, I turned to Doug Azzarito, the OS/2 file system guru for the latest information. The theoretical limit of an HPFS file size is 64GB. This is what can be supported by HPFS. However, in order to access files, a program must use the OS/2 APIs for file access. These APIs will not support the full 64GB at this time. HPFS would support a file size up to the maximum partition size, but because the file APIs only support files up to 2GB, HPFS imposes a maximum file size of 2GB. **OS/2**

David Reich has been with the OS/2 development team since 1987. He is a contributing editor, has written numerous articles on OS/2 and is the author of Designing High-Performance OS/2 Warp Applications published by John Wiley and Sons. David can be reached at 76711.632@compuserve.com and at speedracer@austin.ibm.com.

Critically Acclaimed

The Case for OS/2 Warp



By Esther Schindler

People who praise OS/2 Warp usually focus on its technical excellence. OS/2's features are superb—even its detractors admit that—but few computer users are interested in technology for its own sake. What matters is how well technological advances are applied—what benefits they convey. Buzzwords like “object oriented” and “32-bit” make a difference only when they help us work more efficiently, if we can work without frustration.

OS/2 Warp is a superior solution for real-world use. In particular, OS/2 Warp is still a better operating system for businesses than any other on the Intel platform, and it will likely remain so. In this article, instead of emphasizing OS/2's technical marvels (though I'll mention them), we'll look at OS/2's user benefits and what advantages your company can expect from them.

Think about computer users; maybe they're part of your organization's sales force, or work in the accounting department. Perhaps they inhabit the boardroom. These users need computer technology that lets them accomplish their jobs efficiently, reliably, and understandably. They want to put their attention on the work at hand, not the equipment in front of them; they want to be a graphic artist or a lab technician, not a computer expert. The information services departments, help desks, and consultants who support these users want the computer systems to work perfectly the first time out of the box and to never need service. If they do have trouble, the systems should be easy to troubleshoot.

It just works

Ordinarily, we computer journalists only write about “What's new!” and “Tips for making this gizmo work right!” (We're apt to subtitle such articles, “Getting the most out of your gizmo.”) From years of writing software reviews, I know that it's hardest to write about products that just plain work as advertised. “Yes, it delivers exactly what it promises,” is great news for users but makes a very dull article. As a result, OS/2's most important benefits—its stability and robustness—are rarely mentioned in the computing press.

OS/2 Warp just works. It generally does so without fanfare, without drawing attention to itself and with minimal user frustration. It fulfills the basic requirement of any computer system: staying out of the user's way and letting him concentrate on the work at hand. If you're an OS/2 user with little experience using other operating systems, you might take this for granted. On my own OS/2 Warp system, I try to perform a shutdown once a week, whether it needs it or not, just as preventative maintenance. It astounds me when I talk to computer users who say (I'm not making this up), “Windows runs okay for me. I only have to reboot two or three times a day.” That's okay? Would you drive a car that stalled two or three times a day and say the car runs okay? Microsoft's biggest and most dangerous contribution to the software industry may be the degree to which it has lowered user expectations.

Rebooting two or three times a day is a frustrating inconvenience for employees. It's also an expensive waste of

time for businesses. If an employee is down for 10 minutes a day, that's 10 minutes she can't spend entering orders, writing software, or processing insurance claim forms. Crashes cause the loss of critical business data; if open files on a network server are corrupted, the entire business can be at risk. This isn't simply an issue of keeping employees smiling; it's a question of the company working efficiently.

Of course, let's not believe that OS/2 Warp is perfect. It can crash. A bad video driver can make OS/2 unstable; a poorly written application can bring OS/2 to its knees. And, like the result of any other enormous software project, OS/2 Warp is not bug-free.

However, when OS/2 *does* fail, it's extremely rare for you to lose data. OS/2 was designed “down” from a mainframe paradigm (the ultimate “mission critical” computer, before the buzzword was invented), instead of being designed “up” from a hobbyist microcomputer. Contemplating a mainframe having a General Protection Fault (GPF) in the middle of payroll processing is impossible; OS/2 was designed with the same big-system, big-business viewpoint that your data is the most precious thing in the world. OS/2's Workplace Shell will shoot itself rather than corrupt your work; that's what happens when the Workplace Shell closes up and goes away, rebooting a few minutes later. Most of your applications continue to run without error during this process. Sure, the operating system shouldn't crash at all—but when it does, I'm glad that it doesn't take a bite out of my next book chapter.

I've talked with hundreds of users, from people who support 6,000 OS/2 systems, to small-business owners who threw their boxes of Windows 3.1 across the room in fits of frustration, to retired guys who use their OS/2 systems to keep track of genealogy research. They all chose OS/2 because it's robust and because it worked just like it promised on the box. And that's why they stick with it.

Consistency and flexibility

Part of OS/2 Warp's appeal is its excellent balance between consistency and flexibility. While it's impossible to dispassionately compare the relative merits of user interfaces (such decisions are a matter of personal aesthetics), OS/2 works in a predictable manner, so it's easy to pick up the basics in a manner of minutes. A new OS/2 user can learn, within 10 minutes, that right-clicking always provides a menu of “what you can do now.” None of the other operating systems have this level of predictability, and predictability is what “user friendliness” is all about.

Going beyond the basic functionality, OS/2 lets users make modifications so that it works the way *they* want it to work. One simple example is the degree of system-wide control offered by REXX. A knowledgeable REXX programmer can create desktop objects, query the operating system for directory changes, add macros to a spreadsheet, and automate telecommunication access, all without working up a sweat.

The System Object Model (SOM), the basis of much inside OS/2, lets a programmer integrate changes closer to “how the operating system works.” Whether the change is a minor extension or a significant user interface enhance-

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Ctrl-Alt-Del Commander takes control of rebooting Warp. It overcomes desktop "freeze-ups," allows you to alter application priorities, stop frozen programs, or restart the WPS without affecting running programs including Internet connections. It adds virtual desktops, a PM status line, enhanced window list, hot-key program activation, and a "smart" shutdown to OS/2.

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ment, the benefit of SOM is that you can modify as little, or as much, as you want. For example, SOM let IBM extend the desktop with speech recognition; speech became part of the operating system services. From a management standpoint, you can use this flexibility to control the behavior of the desktops under your purview; flexibility is not (necessarily) a synonym for chaos.

Better support for applications

OS/2's flexibility and customization works to support legacy applications, too. Without a doubt, OS/2 Warp 4.0 still fulfills those OS/2 2.0 promises of "a better DOS than DOS, a better Windows than Windows." If a DOS or Windows application crashes, it doesn't take down the system. And if things go really awry, you can kill the DOS or Windows session with a few mouse clicks.

DOS and Windows 3.1 applications ordinarily run quite well. When they don't, you can customize DOS sessions so that each runs "the way it wants" by using a separate *autoexec.bat* file, specific memory configurations, and precise settings to manage how the system runs. In OS/2 Warp, you can login to several NetWare accounts with multiple private DOS Virtual DOS Machines (VDMs). Don't even try it with another operating system.

In contrast, Windows 3.1 programs do not always work correctly under Windows 95, and, despite Microsoft's original promises, a "Designed for Windows 95" logo is no guarantee of compatibility with a Windows NT workstation. I have personally run into problems running Windows 3.1 applications under Windows NT 4.0, which kept me from getting work done on schedule. For example, Adobe's Framemaker for Windows keeps running out of memory, and the Windows 3.1 version of JASC's Paint Shop Pro won't take screen shots in Windows NT 4.0.

In Windows 95, all 16-bit Windows programs and the 16-bit system components of Windows 95 run in a single session. The 16-bit system components of Windows 95 are modified versions of Windows for Workgroups 3.11 system components; if

one of the 16-bit Windows programs misbehaves (does not yield properly) and locks up the session, all the 16-bit Windows programs stop in Windows 95—just as in they do in Windows for Workgroups 3.11. Sooner or later, a single 16-bit Windows program that misbehaves will also stop the operation of all 32-bit program pieces (threads) that use the 16-bit system components of Windows 95.

If you install Windows NT, you can't be sure that Windows 95 applications will work; if you use Windows 95, you can't be sure of Windows NT application compatibility.

**Without a doubt,
communications is
where OS/2 really
shines.**

One developer explained that his Windows 95-compatible application mysteriously crashes in Windows NT. "So much for that Microsoft promise," he told me.

Despite the oft-uttered criticism about a dearth of native OS/2 applications, my rent check is evidence to the contrary. I earn my living writing about OS/2 and especially about OS/2 applications, and barely a day goes by without another package arriving at my door. It's true that you have to search a little harder to find the OS/2 applications, since the economics of the retail marketplace make it difficult for small vendors to win a spot on store shelves. But the applications do exist—and most of them are worth seeking out. OS/2 does a great job at running DOS and 16-bit Windows applications, but the operating system becomes magnificent when you use native applications that exploit its capabilities.

Connectivity

Without a doubt, communications is where OS/2 really shines. Whether you're using a modem to dial into a BBS or networking across multiple

protocols, OS/2 provides several benefits that can let you leave the office a little earlier on Friday afternoon.

If you have to install or support more than a few dozen OS/2 systems, the CID facility (Configuration, Installation, Distribution), which is built into OS/2 Warp Connect and above, lets you install software remotely. You can install the operating system plus additional applications—from IBM's Communications Manager to Lotus SmartSuite to Development Technologies' DeskMan/2. You can acquire CID-like packages from other vendors for Windows NT and NetWare, but they are expensive additions that are not as effective.

Massimo Squillace is head of client support for a company that manages the information systems for the Italian Ministry of Finance. He supports 20,000 computers, half of which run OS/2. He's especially impressed with OS/2's connectivity features and points out several ways in which OS/2 is head-and-shoulders above its competition in cross-platform support. "OS/2's SNA support is by far the best we tested. The most distinguishing feature is that communications with gateways is implemented at the LLC2 level, which you seldom find outside the IBM environment (OS/2, AIX, OS/400, MVS). I discovered that what you do find rarely works without serious glitches," he says. "In performance tests, IBM's OS/2 Communications Manager, acting as an LU2 (3270 Datastream) gateway, could process seven times as many transactions (screen buffers passed) than the Microsoft SNA Server. Communications Manager sports High Performance Routing, an IBM exclusive, which automatically re-routes SNA sessions when a session failure occurs, with no interruption to the application. In other vendors' solutions, the application must be restarted."

Joe Dougherty, a system administrator for a U.S. Federal agency, told me that he most appreciated the variety of networking protocols available with OS/2 Warp. "It's nice having NetBIOS and NetWare protocols in the box, but having TCP/IP is an even bigger plus considering how important it is for us. We have a LAN separate from the OS/2 Warp Server box,

Not Just at the Office...

Nigel Teags is four years old. He already knows how to drag-and-drop program objects onto the shredder on the family's home computer, and he knows how to click on "his" folder of games. His sisters use the Internet with the WebExplorer to research high-school term papers. His parents, Bill and Debra, dial into the office to upload files for their 20-person package-design business, which runs almost completely on OS/2. When Bill takes the laptop on business trips, he uses BlueCAD on the airplane. (AutoCAD, he tells me, would never fit.)

The benefits that make OS/2 Warp so appealing at work apply for home use, too. At work, you're paid to solve problems. When you're on your own time, you don't want to struggle with equipment that doesn't work. Your free time is limited, and your disposable income is finite, so you can't invest energy fussing with a computer; it has to work. OS/2's multitasking helps you run your personal accounting software while you download a file about Arizona state history for your daughter's term paper. If you have to bring work home from the office, you can get it finished without the word processor crashing on the final paragraph. You can get your "work" done more efficiently, just as you do at the office—even if that "work" is something you do for play.

Companies have justifiable budgets for hardware and software. Home users have to balance the purchase of a new computer with a new car, orthodontia, and fixing the roof. "Legacy applications" means "I can't afford to buy all-new software;" plenty of OS/2 users continue to use their old-but-effective DOS and Windows applications under OS/2 and are grateful for the ability to do so.

Employees of large businesses—the sort that IBM stresses as its primary market—often spend their day using only one or two applications. Small businesses, on the contrary, are interrupt-driven. While they're working in the word processor, a customer might call with a question, or a salesman might call to ask about scheduling a meeting with a new customer. The small-business employee has to run many more programs on any given computer and switch between them often. Effective multitasking is more important to small businesses, not less.

That sounds like marketing hype, but it's what noncorporate OS/2 users repeatedly tell me about why they choose this operating system.

Some computer hobbyists like to fiddle with the system, and, of course, OS/2 gives you plenty of opportunity. One college student, Ethan Hall-Beyer, said, "Once I get it running the way I want, I can go back to using my computer just as a workstation and forget that it's dialed up to the Internet all the time, has an NFS hard drive server for two other machines, serves the null-modem text terminal down in my living room, and so on."

IBM might stress the effectiveness in the market it knows best: corporate America. Yet individuals respond to OS/2 Warp as well. They take it home to get the most out of their home computing time, and they use it to work effectively in their small businesses.

upon which we run a couple of HP servers. From my desk, I can do all the typical functions on those servers using the TCP stack in OS/2 Warp, such as pings, mail, telnet sessions, and traces. I've been looking at some X-Windows packages as well, including the port of Xfree86 to OS/2, which will allow me to log onto both HP systems using software that's available on those servers. I can then perform all the administrative functions I need to from my OS/2 Warp machine, without leaving my desk."

Multitasking that means it

During an ordinary day, I download messages from CompuServe while I

print an article draft, while I install the next application to work on from a floppy disk. I typically have 15 or 20 full-scale applications loaded, and I switch between them faster than a politician changes his opinion. This switching is not something I do to show off, as a carefully scripted demo; this is Esther At Work. All this happens on a 90MHz Pentium-based system with 32MB RAM—quite a modest system even by early 1996 standards. Windows 95 can't begin to switch this way. Windows NT 4.0 is better at multitasking than Windows 95, but I can still discern a hesitation when I switch tasks.

As important as robust multitask-

ing is for me, I've seen plenty of individuals whose entire lives operate on a single thread. Multitasking has benefits for the single-tasking person, too, because well-written applications multithread and do more things at one time, without the user knowing or caring—except that his work is finished faster. Carl Maier, an MBA candidate at the University of California, Riverside said, "When I am running a nonlinear optimization that can literally take five to seven days to complete, I am free to work on other things, despite the fact that every available CPU cycle is given to SAS. OS/2's stability is great and very important; a crash can jeopardize several days of processing." Any amount of time that employees spend staring at a Windows hourglass is wasted time; OS/2's multitasking and multithreading lets workers accomplish more in the same duration.

Hardware you can afford

OS/2 doesn't require heavy-duty hardware, either. For a similar performance and under a similar workload, OS/2 Warp requires less hardware than does Windows 95 or Windows NT. I've reached the point where I'm ready to add more RAM to my PC, but despite the heavy workout I give the system I have no special yearning for a faster processor.

If you examine the "minimum system requirements" for Windows NT and OS/2 Warp, they seem about the same. But as the director of *Infoworld's* test labs, Nicholas Petreley, says, "For a full-powered system, I recommend 24MB RAM for OS/2 or 32MB for Windows NT. The actual cost of ownership is lower for OS/2 when you add in OS/2's other advantages, which far outweigh the dollar savings, since you have to upgrade a lot of other stuff to make Windows NT useful." Because RAM costs around \$10 per megabyte these days, the differences add up.

Perfection? No way

If I'm supposed to address OS/2 Warp's strengths from a real-world perspective, I have to be honest about its weaknesses as well. IBM's SystemView tools help you troubleshoot recalcitrant OS/2 systems that refuse to work correctly, but if you're not connected, the built-in tools

don't necessarily help you find an IRQ conflict.

Despite undeniable improvements, OS/2's installation procedure is still far from perfect. While OS/2 Warp will install perfectly for many people, if you lack up-to-date drivers or have hardware conflicts, you will be cursing as much as you did back in the nasty old days of DOS. If you have the right drivers and recent equipment, your Windows 95 or Windows NT installation will probably be more heartwarming than an OS/2 Warp installation. On the other hand, a bad Windows install is at least as frustrating as a bad OS/2 install. It's worse, in some cases, because Windows is so sure it knows what it's doing that it makes it difficult for you to tell it otherwise.

Another important weakness is that OS/2 Warp doesn't support native Windows 95 and Windows NT applications. You can use something like the Citrix WinFrame (which I haven't yet tested), but that's an expensive add-on. At present, comparatively few Windows NT-exclusive applications exist. The top-selling Windows 95 application is Microsoft Office—what the users that are clamoring for Win32S support usually seem to be asking for. If running Windows 95 applications is really important to you, you would have to take this factor into account.

The rubber meets the road

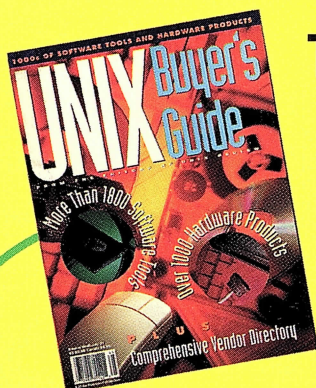
People who engage in market-speak will tell you that OS/2 Warp is a perfect solution. It's not; like anything else, it has its strengths and weaknesses. But when you measure the relative strengths and weaknesses of OS/2 next to its competition, OS/2 is still the best choice around. **OS/2**

Esther Schindler is senior contributing editor of OS/2 Magazine and spends most of her time checking out OS/2 applications and writing about them. She is author of The Computer Speech Book, coauthor of Teach Yourself REXX in 21 Days, and program chair for the Phoenix OS/2 Society (<http://www.possi.org>). You can reach her at 72241,1417@compuserve.com or at esther@primenet.com.

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The Scanning Story

One user's experience with page scanners under OS/2 Warp. By J.C. Love

I've been eyeing scanners for years. What a great way to save time—just scan a document and avoid re-entering text or gluing and taping pictures. Should make life simple, right? And in the small office, a page scanner should have two other major benefits. It should work with a printer to serve as a copier and with a fax-modem to work as a hard-copy fax machine.

Ah, there's the real pay-off. Frequently, I need to make a copy of a document such as an expense receipt, a boarding pass (the airlines don't always get those trips recorded in frequent flyer accounts, you know), deposit slips, and so on. To make a copy, I have to crank up my boat-anchor of a copy machine (sitting high atop my filing cabinet, the only place in my home office I could find for it). Several minutes and a lot of noise later, the copier has warmed up—but then it goes into suspend mode because I've started doing something else and forgotten to start copying. So I push the "ready-to-copy" button and wait another 60 seconds or so, during which I've managed to distract myself long enough for the copier to time out once again. Sigh. A scanner that would allow me to print to my Hewlett-Packard LaserJet without these delays seems like a reasonable solution.

And then there's faxing. Every office must have fax capability these days. I've been using FaxWorks Pro, and it has worked well for incoming faxes. I've also been able to send outgoing faxes as long as they were computer-file-based. If I need to send a fax from a hard copy, however, it has been the old "hop in the car and drive to Kinko's" routine. A scanner would allow me to scan the hard-copy documents into FaxWorks Pro without that separate facsimile machine. Right?

So my objectives were simple. I wanted to be able to copy and fax hard-copy documents.

Esther Schindler's "Scanning In OS/2" (August 1996, pp. 68-71), solved the first part of my problem: choosing the hardware. She concluded that Hewlett-Packard scanners are the safest, most widely supported products available. Once I decided that I wanted to scan in color, I settled on the HP ScanJet 4C, which sells for slightly under \$1000.

"Now, if I were in Germany, I could take advantage of bundling offerings there. For example, Microtek offers its E3 or E6 scanners bundled with an Adaptec 1502 SCSI adapter and Impos/2, a moderately powerful scanning and graphic editing and manipulation

program. I wasn't able to identify any such bundles for OS/2 Warp users currently available in the United States.

Cables, adapters, and drivers

When the ScanJet 4C showed up on my doorstep, I anxiously unpacked it and quickly learned that the provided cable only worked with the proprietary controller included in the scanner's shipping carton. I didn't have the slots available to add another card to my computer's bus and deal with what I suspected would be interrupt challenge (Would the card address the ones I wasn't using—if there were any that I wasn't using?), so I ordered a new cable that would work with my existing SCSI card.

Installing the cable was easy. I even remembered to remove the terminating resistor packs on the Adaptec controller so I could extend my SCSI bus through the cable to the scanner that now terminates the bus. The next challenge involved providing a way for the computer and the scanner to communicate using OS/2—in other words, finding the appropriate OS/2 driver.

Well, in my case, drivers. Because I am connecting the scanner to a third-party SCSI adapter, three drivers are required. One driver provides a basic connection between OS/2 and the SCSI adapter and lets OS/2 communicate with the hard drive. The second driver adds additional device management through the ASPI interface defined by Adaptec, providing the connection points between the SCSI driver and the third driver, the scanner driver.

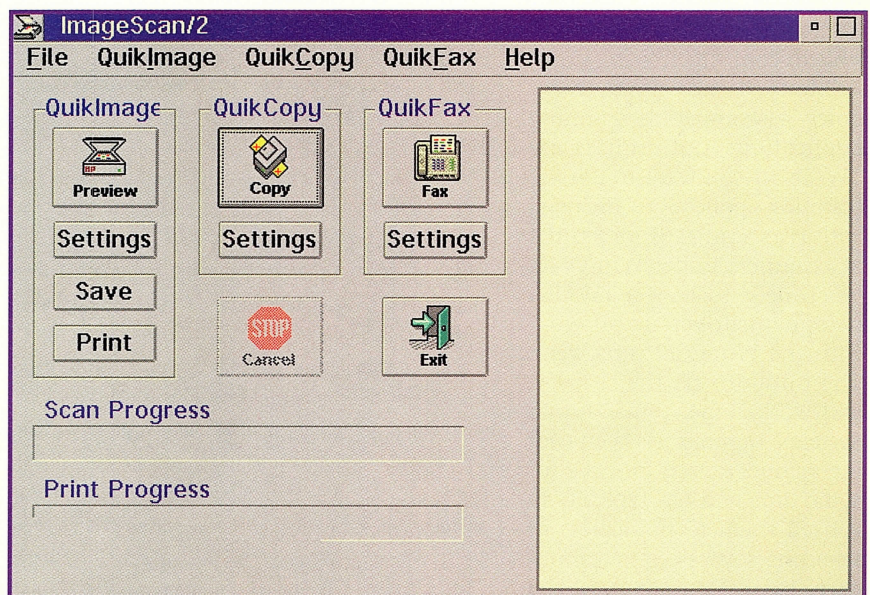


Figure 1: ImageScan/2 allows saving of scanned images and scanning for copying and faxing from a single dialog.

These drivers provide the connections so the scanning program can determine whether the scanner is available. If not, it will report that it can't find a scanner. Instead of having to code the scanner program to include all those scanner types and connection method permutations, just include a driver or drivers appropriate to the scanner and connection type you're using.

You've probably figured out the rub. You're going to have to get the drivers that will work for the scanner and connection you're going to use. Where will they come from? Whether you're running OS/2 Warp, OS/400, Windows 95, Windows NT, UNIX, MVS, or VMS, all hardware requires drivers, and someone has to write them.

Now the TWAIN shall meet

Wouldn't it make sense for all scanning software to be able to look for connections to scanners at the same place, instead of having proprietary drivers for each scanner-scanning software combination? Of course it would, and a scanning driver specification called TWAIN has been developed that can do just that. The name itself is interesting. Many believe that it's an acronym for Technology Without An Interesting Name, though it's been impossible to confirm.

Many, if not most, Windows 3.1-compatible scanning applications and utilities use TWAIN. If you want to use the scanning applications included with HP's ScanJet 3C or ScanJet 4C scanners under Win-OS/2, you'll need to have a TWAIN-compliant driver that'll work with the Win-OS/2 subsystem. The only drivers that I know will work come from Danmar Systems. Danmar has been coding scanner drivers for OS/2 for some time and has typically licensed them to publishers of scanning software on a proprietary basis. Danmar has been marketing its set of drivers (which includes the SCSIscan

drivers for third-party SCSI adapters and the driver for the Hewlett-Packard SCSI adapter that ships with HP ScanJet models), as well as licensing versions of the drivers for use by other independent software vendors.

On the other hand, several native OS/2 scanning programs are available, and most of them provide their own scanner drivers. I'm interested in

avoiding Windows programs, so I decided to look at those more closely.

Compart Systemhaus' Impos/2 is moderately priced at around \$200. It claims to support more than 25 different scanners and works with the Danmar drivers. I worked with Impos/2 briefly, and its graphics editing and manipulation appears to be a welcome addition to my arsenal of

ImageScan/2

ImageScan/2, from Danmar Systems, is a native OS/2 application that works with HP ScanJet IIp, 3p, 4p, IIc, IIcx, 3C, and 4C scanners. As a scanning application, it shows you a scanned image as a preview document, which can be resized, exported to different graphics file formats, or printed. It can also act as a fax front end, sending a scanned image to a fax-print queue, such as FaxWorks' FxPrint.

Installing ImageScan/2 was simple. The install program creates the program's directory if necessary, copies all required files to the directory, and gives you the option of modifying your *config.sys* file. If you choose the default setting, the install program will automatically change your *config.sys*, finding and removing any existing HP DOS or Windows scanner drivers from *config.sys* and verifying that the ASPI device manager is present. If the ASPI device manager is not loaded, the appropriate line will be added to your *config.sys*.

ImageScan/2 has some great OS/2 pluses: It is 32-bit and fully multithreaded. In addition, it includes a new version of the Danmar SCSIscan driver that substantially reduces much of the CPU-intensive processing that scanning requires.

The available settings include the type of scan (black and white, 16- and 256-level grayscale, or 24-bit color), resolution (40 to 1,600 dpi depending on the resolution of the scanner itself), intensity and contrast ranges (controlled with a slider bar), and Invert (black pixel to white and vice versa) and Mirror options. Invert also appropriately affects grayscale and color image pixels. Magnification and Reduction options allow you to enlarge or reduce an image in either or both vertical and horizontal directions from 25 to 400%.

Printing options include printer selection and number of copies to be printed. More sophisticated selections are included as well, such as "Fast B/W PCL Printing," which, if your printer understands the Hewlett-Packard Printer Control Language (HP-PCL), causes print jobs to bypass the OS/2 print routines and go directly to the printer. The "Reduce to 95% and Print Edges" option allows you to print an entire page, including the approximately 1/4" edges that aren't normally printable. ImageScan/2 also recognizes that some scanners have a legal-size scanning bed, and it allows you to choose whether to use the full bed when scanning and printing.

One of ImageScan/2's modules, called QuikCopy, is tailored to process multiple copies of documents. It fully supports the HP Automatic Document Feeder (ADF), although I did not have an opportunity to test it. An interesting copying option, if you don't have this expensive hardware accessory, is to simulate ADF, which, after scanning a document, prompts you to manually insert the next document or to indicate that copying is complete. Simple letter-size to letter-size and legal-size to legal-size paper options are offered in addition to selections such as shrinking legal or A4 documents to letter-size or even roll-your-own custom sizing. Progress bars display the separate scanning and printing threads' progress during the copying process. (All of ImageScan/2's scanning operations are easily started from a single dialog shown in Figure 1.)

I like using ImageScan/2 and especially appreciate its error-free operation. I checked CPU usage during copying and faxing and found that it's very considerate of other processes — not the rule in the world of scanning. I have to be very cognizant of available space on my swap file drive, because high-resolution or color scans can result in rapid and very large increases in swap file size.

I'd like to see some usability enhancements to ImageScan/2. It would be nice to see the current options perhaps displayed as flash panels, when passing the mouse cursor across ImageScan/2's window section relating to each module. I don't like having to open a dialog and then close it just to obtain information. I also wish the number of copies that the software is currently set to print or fax would always be displayed.

For a version 1.0 product, I found ImageScan/2 to be of remarkably high quality and functionality and recommend it to anyone with a supported HP ScanJet desktop scanner.

scanning applications. Although you can probably use it for copying and faxing, it's not the quick and simple solution for those needs.

Also in the graphics world, SPG's ColorWorks is a powerful, moderately priced graphic editing system, often used for photo editing. The product is designed with hooks for scanner drivers but does not provide the drivers themselves, and does not connect to the Danmar drivers.

UniteLite, from Cirrus Technology, is an application for scanning and managing scanned images. Its suggested retail price is under \$300, and it includes drivers for Fujitsu and Hewlett-Packard ScanJet II scanners. A competitor is Solution Technology's Review, which is TWIN-enabled and uses the Danmar scanner drivers.

Applause, also from Solution Technology, is comparable to DeskScan, the Windows-based scanning product that is bundled with HP ScanJet scanners. It uses a Danmar scanner driver created especially for this product.

Recognita is from The Recognita

Corp. and seems to be the only native OS/2 optical character recognition (OCR) software. Recognita has an extensive list of scanners that it supports directly, but it is also compatible with Danmar scanner drivers (not included).

Copyshop/2, from Trafalger Business Systems, will preview, scan, and save scans of documents. It will also scan and copy as well as scan and fax. The version I know of only works with the Hewlett-Packard printers and with FaxWorks Pro for faxing and will not scan in color, but I understand that a new version exists, which overcomes these limitations. Copyshop/2 also works with Danmar scanner drivers.

ImageScan/2 1.0 is a new product from Danmar Systems that competes with Copyshop/2. Either ImageScan/2 or Copyshop/2 will take care of your copying and scanning requirements.

What's next?

I'm now happily scanning, but look forward to implementing OCR for scanned documents as well as for re-

ceived faxes. I plan to embed my scanned images in Notes Documents, set up a scanned image database for receipts and correspondence, and generally eliminate paper from my world.

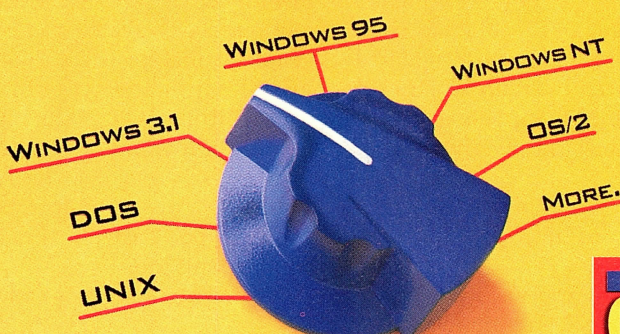
It shouldn't be this difficult, and the Macintosh has shown us that it doesn't have to be. Of course, the Mac's proprietary environment has severely limited the multitude of options and interfaces that the Intel-based computer's mixed blessing of flexibility has allowed. But it's getting better, and I see the future. There isn't much paper in it.

OS/2

J.C. Love develops and presents technology seminar tours for Right Source Inc. He has presented such topics as IBM's Application Development Strategy, Lotus Notes 4.0, and IBM Network Computing and the Internet. In addition, he consults with small- and medium-sized businesses on information technology issues. Previously, J.C. was an IS Manager at UCLA. He can be contacted on the Internet at jclove@ibm.net.

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Advanced Game Design with OS/2

Fast screen updates using the GPI library. By Michael Ramsey

We weren't playing games. Last year, our company wanted to create a next-generation land-based strategy game. We already knew that OS/2 Warp would be the target platform; the next decision was how to code the graphical engine for the game. Master of the Empire would have huge amounts of data that had to be presented to the player in a reasonable time frame. We had to provide graphical displays of the landscape, units, battle animations, and other game functions to the player. We needed to do it quickly and reliably.

We considered two OS/2 libraries, the built-in GPI and DIVE, and chose GPI. Why? Not only was it functionally complete, but it could also perform fast bit-blitting when coded properly. On the other hand, DIVE, IBM's method of writing directly to video memory, hasn't been updated since December 1995, and we weren't certain whether it was undergoing further development. So, this article is about doing fast screen updates for basically any type of game under OS/2—using the GPI.

The game we built is what's known as "tile-based," where the game world is constructed from an assortment of graphical tiles (Figure 1).

When pieced together, these tiles appear as a cohesive environment. Tile-based games have been around in concept since the early days of computer game design and have recently started to make a few noticeable advancements, such as incorporating a pseudo *_perspective* viewpoint. However, we don't use *_perspective* or any particularly fancy technique. We hope once you understand the basic ideas presented here, you will be able to easily extend them to any type of tile game.

The memory device context

A device context is a specified region that the graphics engine and the device drivers use for storing presentation data. The proper use of memory device contexts is essential so that your application provides quick and flicker-free animation.

We're going to create a device context that exists only in memory, aptly called a *memory device context*. To create a memory device context, you call `DevOpenDC` with the second parameter set to `OD_MEMORY`, as `hdcback-`

`ground= DevOpenDC (hab, OD_MEMORY, "", 0L, NULL, NULL).`

After the handle to a device context has been created, you must then associate it with a presentation space.

```
hpsbackground= GpiCreatePS (hab, J
                        /* anchor block handle*/
                        hdcbackground, /* device context handle*/
                        sizl,          /* PS page size*/
                        PU_PELS      | GPIF_DEFAULT | /* Options*/
                        GPIT_MICRO | GPIA_ASSOC);
```

This presentation space is now associated with the memory device context. From here, a cached micropresentation space is created and is represented by the `hpsbackground` variable. The size of the device context is stored in `sizl`. Ultimately, the bitmap is created by the `GpiCreateBitmap` API. If the bitmap is properly created, it is set to the memory presentation space, `hpsbackground`, and is ready to be displayed by calling the `GpiBitBlt` API. Listing 1 shows how to set up a proper memory device context—one that remains open for the duration of the application's life.

If you're coming from a DOS game-programming back-



Figure 1: Master of the Empire as a tile-based game.

Game Design

ground, an easier way to visualize memory device contexts is to think of them as virtual pages. Page flipping in DOS is the concept of storing frames of a world in memory and then blitting them to the screen to achieve animation or just smoother animation.

Map data structures

Before a game map can be constructed, the first step is to organize the environment into a stable structure, which means creating a structure that holds a basic representation of our gaming world. An example of a structure showing how to hold the map's data might look like this:

```
typedef struct real_map    /* a tile of the*/
                          /* world*/
```

Listing 1: Setting up memory device context for usage.

```

HBITMAP tile_background()
{
    BITMAPINFOHEADER2 bmp;
    LONG                alBitmapFormats[2];
    POINTL              aptl[3];
    SIZEL               sizl;
    RECTL               rclActive;
    APIRET              rc;
    HAB hab;
    POINTL ptl;

    if (!dc_setup)
    {
        hab=WinQueryAnchorBlock(HWND_DESKTOP);

        hdcbackground= DevOpenDC (hab, OD_MEMORY, "", OL, NULL,
            NULLHANDLE);
        sizl.cx = 0;
        sizl.cy = 0;
        hpsbackground= GpiCreatePS(
            (hab,                /* anchor block handle*/
             hdcbackground,      /* device context handle*/
             &sizl,              /* PS page size*/
             PU_PELS |          GPIF_DEFAULT | /* Options*/
             GPIT_MICRO |       GPIA_ASSOC);

        memset (&bmp,0, sizeof(BITMAPINFOHEADER2));
        bmp.cbFix    = sizeof(BITMAPINFOHEADER2);
        bmp.cPlanes  = alBitmapFormats[0];
        bmp.cBitCount = alBitmapFormats[1];

        /*size of the context in pels*/
        bmp.cx       = 500;
        bmp.cy       = 500;

        GpiQueryDeviceBitmapFormats(
            (hpsbackground, 2L, alBitmapFormats);
        hbmbbackground = GpiCreateBitmap(
            (hpsbackground, &bmp, OL, NULL, NULL);
        GpiSetBitmap(
            (hpsbackground, hbmbbackground);
    }
    return hbmbbackground;
}

```

```

{
    char contents;      /* an ascii rep of your*/
                        /* object*/
    BOOL explored;      /* has the tile been*/
                        /* explored*/
} world_map_t;

```

This **real_map** structure is just an extremely basic representation of what an actual world structure could contain. You could have link lists off the structure to city, resources, and object structures. Extensibility is the key to designing your game world. Always leave the ability to add new concepts and preserve the possibility of porting your application to another environment. Code for the future.

Once your basic world structure is created, you'll want to have some type of main loop that handles all of the environment's graphical updating. This loop is best handled by creating multiple threads: a basic messaging thread and a separate thread for graphical game calls. These calls ensure that your application is not tied to a single thread, which could restrict it, or worse, monopolize system resources.

The basic tiling concept is one in which the world is broken up into a conglomeration of pieces. These pieces, or tiles, are then pieced together into a playing field for the game. For example, a simple map, could be created out of an ASCII file in which each tile is represented by an ASCII character (Figure 2).

What about displaying the map? The code in Listing 2 will display a 15x15 tiled map in any presentation space that you pass to it. Many OS/2 Presentation Manager programmers scoff at the idea of keeping presentation space resources open for the duration of the

Legend: . Water tile
 + Land tile
 X City tile

[illegible]

Figure 2: A simple ASCII tile map.

application, perhaps causing precious system resources to be monopolized. In a gaming environment, many of these basic rules deserve a second look, mainly for performance reasons. It wouldn't make sense to continually allocate and deallocate resources, that is, bitmaps, audio wave files and the like. Game players are a rather finicky bunch who usually demand the complete attention of the game. If the game is continually swapping out data, then that will negatively affect its performance. A standard rule to follow is if you use a resource often, then keep it in memory instead of deallocating or deleting it.

The code in Listing 2, by the way, can easily be extended to any type of scrolling world, be it a fantasy environment, a parallax background, or a strategy game.

Placing game objects on the world map

A game world would not be complete without the addition of enemy tanks, spaceships, explosions, and the nearly limitless other objects that could populate it. Now that we've created a world, we can add other useful items, such as sprites. These sprites are blitted to the surface of the memory device context, allowing the perception of objects being "in" the world.

Sprites are bitmap objects with a transparent section that allows a portion of the world map to show through, giving the impression that the game piece is actually residing on the map, not just an arbitrary bitmap blitted to the screen. Sprites are stored as rectangular bitmaps, but the transparent region of the bitmap allows the sprite to be shaped as any type of object the designer wishes. Figure 3 shows an example of a sprite: Part A shows the bitmap of the ball, while part B shows the masking that allows the sprite to be placed on the world map without clipping issues.

The easiest way to use sprites in your game is to create two different bitmaps and then include them in your application's resource file. The following code snippet shows how to include bitmaps into a resource file.

```
BITMAP IDB_BALLMASK.J
d:\newimg\ball1.bmp
```

Listing 2: Sample tiling code.

```
Draw_World_Map(HPS hps,int cyClient, int cyMinMax)
{
    POINTL ptl;
    INT xhere,
        yhere,
        i;

    ptl.x = 0;
    ptl.y = cyClient;

    for (yhere=0;yhere<15;yhere++)
    {
        for (xhere=0;xhere<15;xhere++)
        {
            switch (map[i].contents)
            {
                case '.': WinDrawBitmap (hps, hbmWater, NULL,
                    &ptl,0L,0L,DBM_NORMAL); break;
                case '+': WinDrawBitmap (hps, hbmLand, NULL,
                    &ptl,0L,0L,DBM_NORMAL); break;
                case 'X': WinDrawBitmap (hps, hbmTree, NULL,
                    &ptl,0L,0L,DBM_NORMAL); break;
            }

            i++; /* map counter*/
            ptl.x+=(32*ar); /*size of each bitmap * aspect ratio */
        }
        ptl.x=0; /*reset the tile position the leftmost
            block*/
        ptl.y+=(32*ar);
    }

    return 0;
}
```

Listing 3 : Loading in two bitmaps to represent a sprite.

```
case WM_CREATE:
    hps=WinGetPS(hwnd); /* create a ps */
    /* load in the bitmaps we want to use */
    hbmBallMask = GpiLoadBitmap (hps, NULL, IDB_BALLMASK, 32,32);
    hbmBallImage = GpiLoadBitmap (hps, NULL, IDB_BALLIMAGE,32,32);
    WinReleasePS(hps);
    return 0;
```

```
BITMAP IDB_BALLIMAGE.J
d:\newimg\ball2.bmp
```

Once the bitmaps have been included into your application's resource file, you must load them into your application. This is accomplished by issuing a call to **GpiLoadBitmap**, which allows for a multitude of actions to occur upon the loading of a bitmap. You can scale it, distort it, or read the bitmap from a separate resource DLL. When a bitmap is loaded in from the game's resource file, it is assigned to a

handle that represents the bitmap. This is how you will address the bitmap throughout the game. The code snippet in Listing 3 shows how to load a bitmap from a resource and then assign it to a handle. It also shows how to have separate handles that comprise one sprite—its transparent portion as well as its viewable portion.

Once we've loaded our sprite ob-



Figure 4 part A, image w/white background for masking



Figure 4 part B, image w/black background for masking

Figure 3: An example of a sprite.

Listing 4: Drawing a sprite to a Presentation Space.

```
draw_sprite(HPS hps)
{
    POINTL aptl[4]= {0,0,
        0,0,
        0,0,
        32,32};
    POINTL ptl;

    /*location to draw the sprite at*/
    ptl.x=100;
    ptl.y=100;

    aptl[0].x=ptl.x;
    aptl[0].y=ptl.y;

    aptl[1].x=ptl.x+(32);
    aptl[1].y=ptl.y+(32);

    GpiWCBltBlt(hps, hbmBallMask, 4L,aptl,ROP_SRCAND, BBO_IGNORE);
    GpiWCBltBlt(hps, hbmBallImage, 4L,aptl,ROP_SRCPAINT,BBO_IGNORE);

    return 0;
}
```

ject into memory, we are now ready to blit it to the memory device context. To blit the sprite to the desired

device context, all we need is the handle that represents the device context's presentation space. The

blitting of the sprite to the device context is handled by the **GpiWCBltBlt** function, which uses a mixture of raster operations to achieve the masking process, thereby allowing the sprite to be placed on the world map without disturbing the underlying world. These raster operations are **ROP_SRCAND** and **ROP_SRCPAINT**. Listing 4 shows how to blit an image, along with its proper mask, to achieve the goal of not disturbing the underlying world.

The full world

With these techniques, you can construct the basic tools needed to build a game world, just as in a real OS/2 game. Maybe based on these, you'll have the next OS/2 best-seller! **OS/2**

Michael P. Ramsey, a senior software engineer at Trillium Software Products, is currently the lead programmer on Master of the Empire. He can be reached at 73672.2052@compuserve.com.

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Reader Service No. 12

Scripting Object REXX Agents

Intelligent agents offer the winning bid.

By Michael Baryla, Gary Cole, and Paul Everett

Harried workers who wish they could clone themselves to keep up with the frenetic pace of the '90s may soon get some relief. But help won't arrive in the form of a friendly clone. Instead, it will arrive from cyberspace in the form of intelligent agents.

Intelligent agents are programs that travel through a network doing tasks for users. Agents could, for example, shop in virtual malls for the best deal on a video camera, monitor and trade stocks, or even bid at a cyberspace auction. Intelligent agents serve as the user's ambassadors in cyberspace, making decisions based on the user's preferences.

Agent technology is poised for success, because it provides value by saving time. Who couldn't use an army of virtual assistants? However, the technology alone won't bring value to users. Success will require new applications that use agents.

This article explores how these new applications work and what you might need to do to write them. We'll look at a sample application written in Object REXX that is based on a demonstration shown at a SHARE conference. The application shows an implementation of a cyberspace auction house where intelligent agents, if you'll excuse the pun, do their users' bidding.

Object REXX is included with OS/2 Warp 4.0. To understand the program examples in this article, you'll need to refer to the Object REXX Reference online document (*orex.x.inf*).

Cyberspace auction

Mr. Moyle is a fictitious entrepreneur who runs an auction house. He wants to expand his operation by holding auctions in cyberspace. The advantage to Mr. Moyle is that he will gain access to a huge number of bidders. The advantage to bidders is that they will have access to goods that might not be available at a local auction. Moreover, prospective bidders might not have the time to attend a real auction. So Mr. Moyle decides to invest in a cyberspace auction house.

Mr. Moyle first calls a network service provider and explains what he wants. The service provider recommends an agent-based solution. In the pro-

posed solution, the service provider will let Mr. Moyle use a generic "agency server" for holding the auctions. The agency server is part of the infrastructure that the service provider already has in place to satisfy these sorts of business requests.

The agency server's role is to accept agents sent to it from authorized users (such as Mr. Moyle), revive the agents, and route the agents appropriately. The agency server doesn't do any application-specific processing. It just manages incoming agents (Figure 1).

The service provider will also develop a "moderator agent" and "client agents." These agents would be written in Object REXX. These agents are specific to Mr. Moyle's problem.

The moderator agent plays the role of the auctioneer. Mr. Moyle would hold an auction by sending this moderator agent to the agency server. The agency server revives the moderator agent and then waits for other agents to arrive.

In our example, the auction moderator doesn't immediately start an auction. Instead, it waits for a predetermined number of client agents to be routed to it from the agency server. These client agents are sent by users who want to bid at the auction. We also call them "bidder agents."

When a bidder agent arrives at the agency server, the

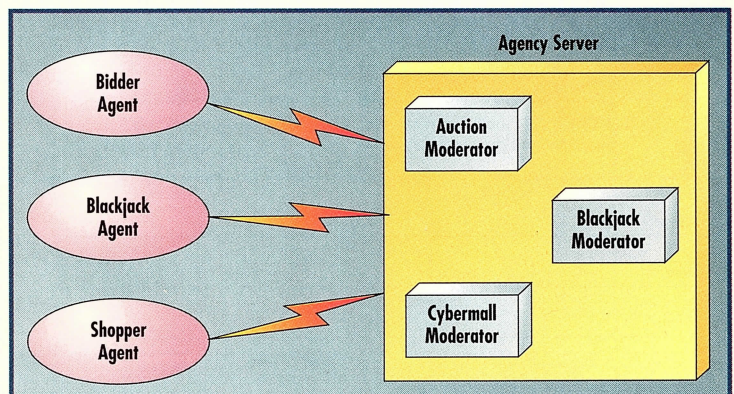


Figure 1: Agents, moderators, and agency servers.

Object Rexx

agency server revives the bidder agent and routes it to the appropriate moderator. (The agency server could have started several moderators that are doing different tasks for different businesses.) The moderator registers the arrival of the new bidder. When an adequate number of bidders arrive, the moderator starts the auction.

The bidder agents contain the intelligence of a bidder. That is, they would know what to buy, would have a maximum bid for each item of interest, and a bidding strategy. In this simplified scenario, the bidding strategy for all the bidder agents is the same. A real application might let the user tailor the bidding strategy.

Intelligent bidding

Someone interested in bidding in a cyberspace auction would request a bidder agent from the service provider. After getting the bidder agent, the auction-goer could participate in the auction in one of two ways: with interaction or without interaction. Let's look at both situations using two auction-goers named Jessica and Mary.

Jessica doesn't have time to attend the auction, nor does she have time to monitor its progress. She chooses to participate without interaction. In this case, Jessica would personalize the bidder agent by specifying desired items and maximum bid prices for those items. Then she would send the agent to the agency server that is running the auction. When the agent is sent, it operates autonomously at the agency server. No programs execute on Jessica's machine. Jessica could shut-down OS/2 and catch a flight for Rio while her bidder agent handled the auction. At her hotel, Jessica might use her laptop to check for e-mail summarizing the outcome of the auction.

Mary, on the other hand, is an interactive auction-goer. She prefers to browse information about the available items before making selections and setting maximum bids. She also wants to monitor the progress of the auction once it starts. To browse information, Mary would use a Web browser (such as Netscape Navigator or WebExplorer) to retrieve HTML pages from a World Wide Web server. The service provider would set up and maintain the Web server for Mr. Moyle. Mr. Moyle would provide appropriate HTML pages. A

Web browser might also be used to gather Mary's selections and prices. Because this information would have to be passed to an Object REXX bidder agent, some extensions would need to be added to the Web browser (or a different graphical interface could be used).

When Mary makes her selections, she indicates that she is ready to participate in the auction. Because Mary wants to monitor the auction, however, her bidder agent is not sent to the agency server. Instead, a proxy agent is

Listing 1: Example of an autonomous agent.

```

/*****
/* Autonomous Bidder Agent "JESSICA"
*****/
BD=.Buyer~new('Jessica','1 Easy Street') /* create buyer */
BD~ShopFor("MIG29", 39000) /* create shopping list */
BD~ShopFor("sculpture", 18000)
BD~ShopFor("shades", 100)
Return BD

::class Buyer /* An individual buyer agent/proxy */

::method init
  expose Address ShoppingList
  use arg Name, Address
  self~objectName = Name
  ShoppingList=.Directory~new

::method Address; expose Address; Return Address

::method ShopFor
  expose ShoppingList
  use arg ItemName, MaxPrice
  ShoppingList[ItemName]=MaxPrice

::method NewItem
  expose ShoppingList increment
  use arg ItemName
  If ShoppingList[ItemName]=.nil then
    Reaction = "Nope; not on MY list!"
  else do
    Reaction = "Hey, I WANT that!"
    increment = shoppingList[ItemName] % 10
  end
  Say self~string 'admires the' ItemName '...' Reaction

::method hear

::method tell /* Auctioneer reports a new bid */
  expose ItemName ShoppingList Increment
  use arg NewItem, Asking, Bid, Who, Patter
  If NewItem \= ItemName then do
    ItemName = NewItem
    self~NewItem(ItemName)
  end /* If ItemName... do */
  If ShoppingList[ItemName]\=.nil then Do
    If (Asking<ShoppingList[ItemName]) then Do
      If Who \= self~string then Return Bid+Increment /* I bid*/
    end /* else do */
  end /* of If ShoppingList... do */
  Return 0 /* "I don't choose to bid" */

::method close
  say 'Goodbye from' self
  return
```


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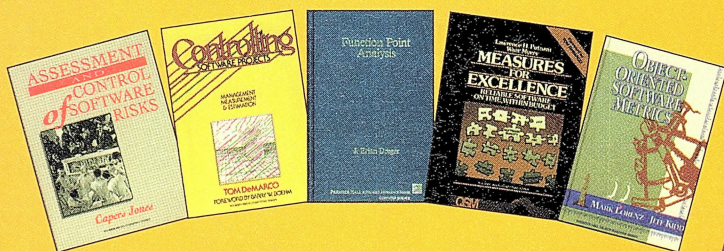
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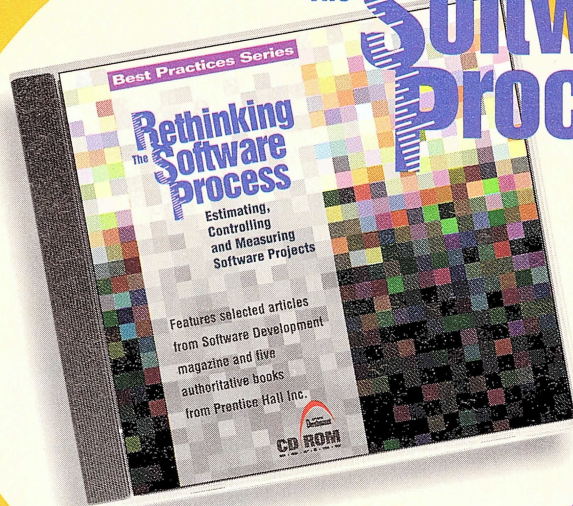
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sent. This proxy agent contains no bidding intelligence. It routes Object REXX messages between the moderator agent at the service provider and a corresponding proxy agent running on Mary's machine. (In our example, proxies are used in pairs.) As the auction progresses, the bidder agent generates HTML panels based on messages received from the moderator agent via the proxies. Mary can view these panels with the WebExplorer.

Implementing these agents might seem like a Herculean task, but it's actually not much different from writing a regular Object REXX program. Most of the complexity (communications, multitasking, queueing of incoming agents, and so on) is hidden in the infrastructure or is eliminated by the nature of Object REXX itself.

Structures in cyberspace

Let's take a closer look at how you could implement the above scenario with Object REXX. We'll use Mary's interactive bidder agent as the example, because it shows how more of the pieces fit together (Figure 2).

Figure 2 shows both the client and server sides of the implementation. Public and private aspects also exist.

On the client side, we have a Web browser (such as WebExplorer). The Web browser uses HTTP to communicate with a World Wide Web server (the IBM Internet Connection Server).

The auction moderator dynamically generates HTML pages. These pages contain pictures and descriptions of the items available for auction. When prospective bidders want information about the available items, they use WebExplorer to view the pages. WebExplorer and the Internet Connection Server use regular HTTP for communications and can be thought of as the public side of the application.

The private side of the picture is a bit more interesting. Mary would use either a souped-up WebExplorer or some other graphical interface program to select items to bid on and to set maximum prices. When she indicates that she wants to send her agent to the auction, the graphical

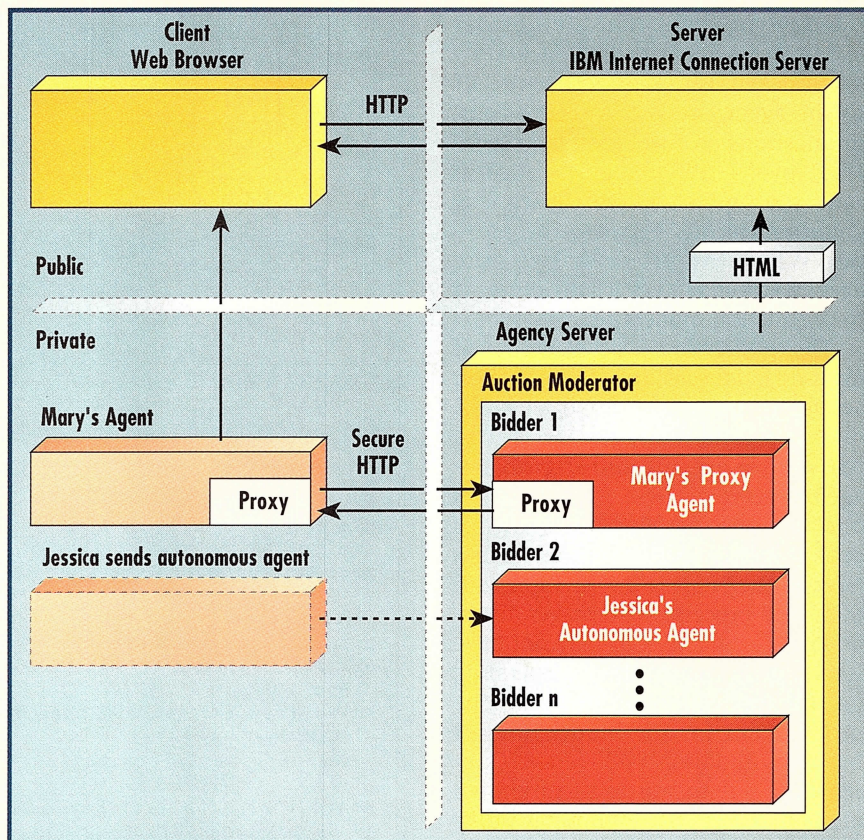


Figure 2: Structure for mobile agents over Internet.

Listing 2: Example of an interactive agent.

```

/*****
/* Interactive Agent "MARY"
*****/

/* Code would be added here to get the user's name, items to
/* bid on, and prices for those items. A graphical program
/* would gather the information and then write it as a public
/* .ENVIRONMENT object so that the values would be accessible
/* from this program. The graphical program would run
/* this program

IAm = .buyer~new(MyName,"The InterNet") /* Create a buyer
/* object for the user

do while ... /* Loop through the list of items
IAm~ShopFor(item, price) /* read in and use the ShopFor
end /* method to set instance variables */
Return IAm

/* HTMLFILE.CMD would contain a class for generating HTML*/
::requires 'htmlfile.cmd'
/* -----
::class Buyer /* An individual buyer agent/proxy*/

::method init
expose Address ShoppingList htmlOut
use arg Name, Address
ShoppingList=.Directory~new
self~ObjectName=Name
htmlOut = .htmlFile~new("Moyle's Bidder")

::method Address; expose Address; Return Address

```

cont'd on p. 38

interface program starts the bidder agent and a local proxy on Mary's machine. It also sends a proxy agent to the agency server. A secure communications protocol (perhaps secure HTTP over TCP/IP) would be used to send the proxy and for subsequent communications between the proxies. When the proxy arrives, the agency server revives it and routes it to the auction moderator.

The moderator runs the auction. It informs bidder agents of the auction activity by using regular Object REXX messages. The messages are sent to the bidder agents running on the agency server. These bidder agents may be either autonomous agents or proxy agents. Autonomous agents have all the bidding information with them and process the messages directly. Proxy agents may or may not have some intelligence in them, depending on the application. In our case, the proxy agent for the bidder doesn't have any bidding intelligence. Consequently, it forwards all unknown messages to the corresponding proxy running on the user's machine, which, in turn, relays the messages to the intelligent bidder agent running on the same machine.

Messages from the intelligent bidder agent to the moderator are handled in a similar way. They're directed to the local proxy agent that then forwards the message to the proxy running on the agency server. This proxy issues the message to the moderator.

Writing agents in Object REXX

Web browser extensions, Web servers that return dynamically generated HTML, and agency servers are part of the infrastructure needed for mobile agents. Assuming these infrastructure pieces are in place, it's useful to know how to write client agents and moderator agents. Here is where the action will take place for application developers.

Listing 1 shows an example of an autonomous client agent named JESSICA. This agent would be sent to the agency server. As part of the communication, the name of the moderator would be sent, as well as the name of the user, and so on. JESSICA contains a Buyer class definition as well as all

Listing 2: Cont'd from p. 37.

```
::method ShopFor
  expose ShoppingList
  use arg ItemName, MaxPrice
  ShoppingList[ItemName]=MaxPrice

::method NewItem
  expose ShoppingList htmlOut increment
  use arg ItemName
  If ShoppingList[ItemName]=.nil then
    Reaction = "Nope; not on MY list!"
  else do
    Reaction = "Hey, I WANT that!"
    increment = shoppingList[ItemName] % 10
  end
  htmlOut~h2(self~string 'admires the' ItemName '...' Reaction)

::method hear
  expose htmlOut
  use arg patter
  htmlOut~hr
  htmlOut~h2(patter)

::method tell /* Auctioneer reports a new bid */
  expose ItemName ShoppingList Increment htmlOut
  use arg NewItem, Asking, Bid, Who, Patter
  myBid = 0
  If NewItem \= ItemName then do
    ItemName = NewItem
    self~NewItem(ItemName)
  end /* If ItemName... do */
  htmlOut~h2('The auctioneer says,' Patter)
  If ShoppingList[ItemName]\=.nil then Do
    If (Asking<ShoppingList[ItemName]) then Do
      If Who \= self~string then do
        htmlOut~h2("I'll bid" Asking 'for the' NewItem)
        myBid = Asking
      end
    end
  end /* else do */
  end /* of If ShoppingList... do */
  htmlOut~flush
  Return myBid

::method Close
  expose htmlOut
  htmlOut~flush
```

Listing 3: Example of a moderator agent.

```
/*****
/* Object REXX Mobile Agent Demo */
*****/
/* hold an auction, loading bidder agents from disk */
*****/

return .Auctioneer~new("The Colonel")
/* ----- */
::class Auctioneer

::method init
  expose Bidders Merchandise
  use arg name
  self~objectName = name
  Bidders=.array~new /* array of 'bidder' objects */
  Merchandise=.queue~new /* The items to auction */
  Merchandise~push(.Item~new('MIG29',,
    'a supersonic MIG29 fighter', 50000))
  Merchandise~push(.Item~new('sculpture',,
    'a stylish sculpture of a computer', 20000))
```

cont'd on p. 39

Listing 3: Cont'd from p. 38.

```

Merchandise~push(.Item~new('book',,
    'a guide to Endicott pizza places', 15))
Merchandise~push(.Item~new('shades',,
    'totally cool shades', 200))
Merchandise~push(.Item~new('squirt gun',,
    'Voice Activated Water Gun', 50))
Merchandise~push(.Item~new('software',,
    'Mr. Fun GamePak', 40))

::method Register unguarded
    expose Bidders
    use arg NewBidder
    Number = Bidders~Items + 1
    Bidders[Number] = NewBidder
    say NewBidder~string "registers for the Auction."
    If Bidders~Items = 3 then self~HoldAnAuction

::method HoldAnAuction
    expose Bidders Merchandise
    reply                                /* door open for new registrations */
    self~babble("WELCOME to the auction!")
    do while merchandise~items >0
        Item = Merchandise~pull          /* Get something to sell */
        self~SellItem(Item)
    end                                  /* do while */
    self~babble("That's all the merchandise we have. Thanks for",
        "coming!")
    self~close

::method close
    expose bidders
    do all over bidders
        all~close
    end

::Method SellItem
    Expose Item CurrentBidder CurrentBid Asking
    Use Arg Item
    self~babble(self~string": Hey, we got" Item "here! Show it",
        "Vanna.")
    self~babble("Come closer, folks, and you'll see this is",
        item~text'.')
    quits=0

    markDowns = 0
    CurrentBidder=.nil

    factor = '1'||copies('0', length(item~price) - 1)
    currentBid = item~price - factor
    Do until Quits                                /* til we sell it or give up */
        factor = '1'||copies('0', length(currentBid) - 1)
        roundPrice = (currentBid%factor)*factor /* trunc to factor */
        asking = roundPrice + factor             /* bump by factor */
        if self~holler("Okay, who has $"Asking "for" Item~text'?)
            then
                iterate
                self~babble('Now bidding on: ' item)
                call SysSleep 3
                if self~holler("It's a STEAL at $"Asking"! Who'll bid?")
                    then
                        iterate
                        self~babble('Now bidding on: ' item)
                        if currentBidder \= .nil then
                            self~babble(currentBidder~string "owns the bid at",
                                currentBid".")
                            call SysSleep 3

                        if self~holler("LAST CALL at $"Asking"...") then
                            iterate
                            self~babble('Now bidding on: ' item)
                            call SysSleep 3

```

cont'd on p. 40

the methods necessary to interact with the auction moderator.

Compare JESSICA with Listing 2, which contains part of an interactive agent named MARY. Like JESSICA, MARY contains a Buyer class definition and all the methods for interacting with the auction moderator. Because the agent is interactive, however, it uses some additional methods that generate and display HTML pages. (The HTML-related methods are not shown.)

MARY does not contain any communication code. The methods are invoked by the local proxy object. The proxy would also be an Object REXX program that used a communications class (for example, REXX socket support that is "wrapped" in objects).

Listing 3 shows AUCTION, an example moderator. For brevity, the AUCTION moderator does not show the code for generating dynamic HTML panels describing the items for sale. (HTML is just text, and text strings are easily generated by Object REXX.)

Moderators need to support the methods that an agency server will send to them. In our example, the agency server sends a REGISTER message to the moderator when a bidder agent arrives. When three agents have been registered, the auction starts.

The auction moderator sends regular Object REXX messages to various bidder agents that it has registered. Notice that the auction moderator does not contain any communications code. It treats all agents the same, whether they are local or remote. In fact, the moderator doesn't even know whether the agents are local or remote. The proxies isolate the communications code.

Agents that want to bid at the auction must support the methods used by the moderator. If you, as an application programmer, are writing both the client agent and the moderator, that's not a problem. If you are expecting others to write their own client agents (as might happen with interactive games or program trading), you'll need to document the methods that need to be supported by your clients.

What's unusual about the examples is that they don't look like agent programs or client/server programs. Instead, they look like regular Object REXX programs. One of the few concessions made for agent technology is that the moderator code is separated from the bidder code.

Other agent applications would follow the same model. Want to write a cyberspace blackjack game? You'll need a moderator that functions as a dealer and a client that knows how to play a hand. The dealer would accept new players from the agency server, deal cards, and handle payoffs. The client agents would need to accept cards, decide how to play the hand, and respond to dealer requests for decisions on whether to hit or stand.

But why should agents have all the fun? Liberate yourself from your desk by using intelligent agents to do your work in cyberspace. You'll have more time to enjoy the real world. **OS/2**

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Resources:

Baryla, Mike, Cole, G., Cramer, M., McGuire R., and Priitko, S. "REXX is for Lovers." *REXX Report*, Summer 1994, published by *OS/2 Developer*.

Web site for IBM Internet Connection Servers:
<http://www.ics.raleigh.ibm.com>

Web site for the REXX language:
<http://www2.hursley.ibm.com/rexx/>

Listing 3: Cont'd from p. 39.

```

if CurrentBidder=.nil then do                                /* Nobody has bid */

    CurrentBid = CurrentBid % 2                               /* so cut the price */
    markDowns = markDowns + 1
    If (CurrentBid < 15) | (markDowns > 2) then do
        Quits=1                                               /* give up on this item */
        self~babble("No bids for this great item?")
        self~babble("Pfui! We just won't sell" Item~string,
                    "today!")
    end                                                       /* if Asking <1 then Do */
end                                                         /* if CurrentBidder...do*/
else do                                                       /* CurrentBidder exists, so... */
    Quits = 1
    self~holler("SOLD to" CurrentBidder "for $"CurrentBid)
end /* of else do */
end                                                         /* do until quits */

::method holler
expose bidders Item asking CurrentBidder CurrentBid
use arg patter
say ""
say self~string":" Patter
If CurrentBidder = .nil then BidderName="None"
else BidderName = CurrentBidder~string
Action = 0
Do all over Bidders
    rc=all~tell(Item~string, asking, CurrentBid, BidderName,,
                patter)
    If rc = 0 then nop                                         /* Bidder did not bid */
    else do
        self~GotABid(rc, all)
        Action = 1                                           /* at least one accepted bid */
    end                                                       /* else do */
end                                                         /* do all over */
return Action                                                /* 1 if bid(s) accepted, else 0 */

::method babble
expose bidders
use arg patter
say
say patter
do all over bidders
    all~hear(patter)
end

::Method GotABid /* A bidder makes a bid */
expose CurrentBid CurrentBidder
use arg Amount, Bidder
if CurrentBidder = .nil | Amount > CurrentBid then do
    CurrentBid=Amount
    CurrentBidder = Bidder
    self~babble(self~string":" CurrentBidder~string "bids",
                "$"CurrentBid!")
    return 1                                                 /* Bid was accepted */
end /* Do */
else return 0                                                /* Bid was not accepted */

/* ----- */

::class Item

::method init
expose ItemText AskingPrice
use arg ItemName, ItemText, AskingPrice
self~objectName = ItemName

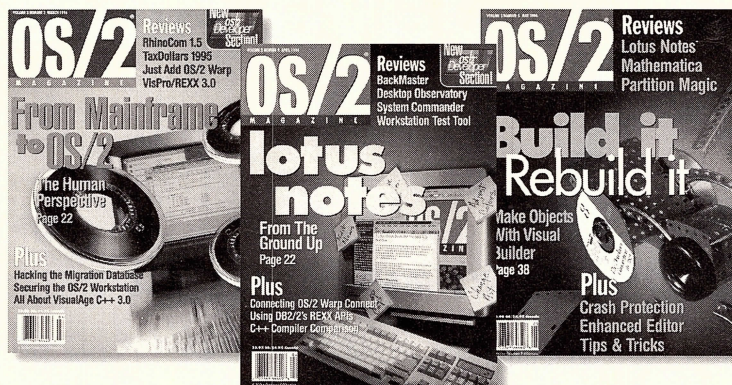
::method Text; expose ItemText; return ItemText

::method Price; expose AskingPrice; return AskingPrice

/* ----- */

```


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Java Alive!

BY MARK BENGE AND MATT SMITH

We decided to start the New Year off on a different paw. Having had a few too many during the holiday season caused us to behave strangely and got us "a-thinkin'." Odd that capucinos and espressos can still alter our mental state—you would think that we'd be immune by now, since we've had an intravenous line hooked directly to the coffee pot for some time!

Caffine high...

After those coffee treats, we started to look closely at the new version of OS/2 and how it provides its Java support. We couldn't help but notice how Java applets ran within Netscape for OS/2—it appeared to us

that the applet area was just another window contained within the Netscape page, just like a push button, list box, or combo box.

Thinking about that possibility, it seemed very possible to do the same thing within one of our own windows, whether it be a normal client window or a custom control. Knowing how curious most cats are, we turned loose the kitties to sniff around the Java and let us know.

Hide and seek...

Java is found in the \javaos2 directory and contains five subdirectories. In the first subdirectory, \javaos2\bin, are the applet and Java program viewers. The actual Java engines are found in the \javaos2\dll subdirectory.

One DLL that the kitties sniffed out was *jempo10.dll*. This DLL contained entry points to things that we thought might be able to help us in implementing Java easily within a PM app. Note the word *easily*. If you remember all the Java commotion out there, then you'll remember that Java is basically a self-contained entity, which means we only have to host it and let it do all the work. Now that is the kind of stuff we and the cats like!

Our dilemma was to figure out how each of the entry points in the *jempo10.dll* worked. First, we examined how Java is implemented. When you have the base Java installed along with the Java toolkit, you can experiment with some of the samples that are part of the Java toolkit by dragging the *.html* files to the Java Applet Viewer from HTML, which is located in the Java for OS/2 folder. This causes the viewer to read in the *.html* file and start the Java applet defined within it.

What we found most interesting is that the class for the client area of the viewer is the same class as for the applet area, which you may find within Netscape for OS/2 when it runs an applet (*awtCdwClass*). In either case, various Java DLLs are loaded, including the one of interest. Also, from the \javaos2\lib directory, two *.zip* files, *classes.zip* and *jempcl10.zip*, are opened by the Java engine.

So how could we tap into this and run Java applets within our own applications?

We did seriously consider doing a little black art with the DLL, but lo and behold, the Internet came to our rescue.

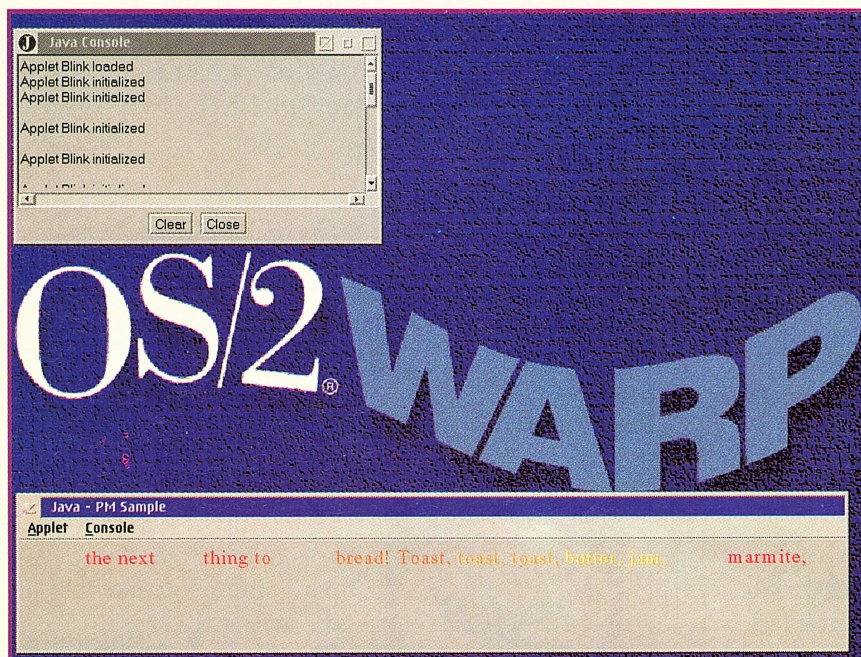


Figure 1: Sample PM App with Java Console.

AlphaWORKS!

Depending on who you talk to, you may get the idea that Java and PM can't easily be combined in your programs. The fine folks who brought us AlphaWORKS think otherwise (<http://www.alphaworks.ibm.com>).

These people actually created the J-Empower DLL (*jempo10.dll*), which contains the necessary APIs to be able to take a Java applet and run it successfully within a PM window. And through AlphaWORKS's Web pages, we were able to find a toolkit that defines the J-Empower APIs that are used both within Netscape for OS/2 and the Java applet viewer.

J-Empower APIs

The J-Empower APIs provide the means for initializing the Java engine and for loading and running a Java applet (Listing 1). J-Empower provides 18 APIs that are quite simple to use. You can, in fact, run a Java applet by using just four of the APIs: **jeInitJavaRuntime**, **jeAppletInit**, **jeAppletStart**, and **jeAppletStop**. Two other APIs may be necessary if you need to position or resize the Java applet.

Nice as the J-Empower toolkit is, it does not document the APIs adequately. There isn't enough room here to fully document each of the APIs; for more info, check out the special Web page at <http://www.prominare.com/prominare/guicorner.java.html>, which fully documents the APIs.

We should warn you: The API documentation on our Web page is based on our own experimentation and observations. You may be able to do more than we have discovered. If you do discover new usage and would like to share the information, please let us know, and we'll add the information to the Web page.

From HTML to PM

The main API, **jeAppletInit**, is designed to take the information that may be used within the APPLET HTML tag and pass it to the Java engine.

First, take a look at Listing 2,

Listing 1: J-Empower API.

```
typedef unsigned long JEAPPLETHND;
typedef unsigned long JECONTEXTID;
typedef int JERESULT;
typedef enum tagJeSecurityCode {
    JE_SEC_CLASSLOADER    = 1,      /* noparam */
    JE_SEC_THREAD         = 2,      /* noparam */
    JE_SEC_THREADGROUP    = 3,      /* thread group name */
    JE_SEC_EXIT            = 4,      /* exit code */
    JE_SEC_EXEC           = 5,      /* cmd to exec */
    JE_SEC_LINK           = 6,      /* lib name to link */
    JE_SEC_PROPERTIES     = 7,      /* noparam */
    JE_SEC_PROPERTY       = 8,      /* property name */
    JE_SEC_FILE_READ      = 9,      /* file name */
    JE_SEC_FILE_WRITE     = 10,     /* file name */
    JE_SEC_FD_READ        = 11,     /* noparam */
    JE_SEC_FD_WRITE       = 12,     /* noparam */
    JE_SEC_SOCKET_LISTEN  = 13,     /* portnum */
    JE_SEC_SOCKET_ACCEPT  = 14,     /* host:portnum */
    JE_SEC_SOCKET_CONNECT = 15,     /* fromhost->tohost */
    JE_SEC_PROTOCOL       = 16,     /* protocol name */
    JE_SEC_PACKAGE        = 17,     /* package name */
    JE_SEC_DEFINITION     = 18,     /* package name */
    JE_SEC_FACTORY        = 19,     /* noparam */
    _JE_SEC_FORCESHORT    = 32767   /* ignore. forces enum to be */
                                   /* a short */
} JeSecurityCode;

typedef int (* JELINKAGE jeCheckSecurityFnPtr)(JeSecurityCode,
    char *String);
typedef int (* JELINKAGE jeShowConsoleFnPtr)(const char
    *string);
typedef void (* JELINKAGE jeShowDocumentFnPtr)
    (JECONTEXTID contextID, const char *url,
    const char *target);

JERESULT _System jeInitJavaRuntime(void);
void _System jeVersion(int *majorVersion, int *minorVersion);
JERESULT _System jeConsoleShow(int show);
JERESULT _System jeRegisterShowConsole(jeShowConsoleFnPtr
    fnPtr);
JERESULT _System jeGetProperty(const char *key, char *value,
    int valueLength, int *trueLength);
JERESULT _System jeSetProperty(const char *key,
    const char *value);
JERESULT _System jeAppletInit(JEAPPLETHND *pAppResult,
    JECONTEXTID contextID, HWND parent,
    const char *documentURL, const char *code,
    long width, long height, int parmCount,
    const char **parms);
JERESULT _System jeAppletStart(JEAPPLETHND applet);
JERESULT _System jeAppletStop(JEAPPLETHND applet);
JERESULT _System jeAppletDestroy(JEAPPLETHND applet);
JERESULT _System jeAppletResize(JEAPPLETHND applet, long width,
    long height);
JERESULT _System jeAppletsIconify(JECONTEXTID contextID);
JERESULT _System jeAppletsUniconify(JECONTEXTID contextID);
JERESULT _System jeAppletsDestroy(JECONTEXTID contextID);
HWND _System jeHWNDFromHandle(JEAPPLETHND applet);
JERESULT _System jeRegisterShowDocument(
    jeShowDocumentFnPtr fnPtr);
JERESULT _System jeRegisterShowStatus(
    jeShowDocumentFnPtr fnPtr);
JERESULT _System jeRegisterCheckSecurity(
    jeCheckSecurityFnPtr fnPtr);
```


Listing 2: Example1.html—blinking text Java applet.

```
<title>Blinking Text</title>
<hr>
<applet code="Blink.class" width=300 height=100>
<param name=lbl value="This is the next best thing to sliced
    bread! Toast, toast, toast, butter, jam, toast, marmite,
    toast.">
<param name=speed value="4">
</applet>
<hr>
<a href="Blink.java">The source.
</a>
```

Listing 3: jeAppletInit implementation of Example1.html.

```
case WM_CREATE :
{
    CHAR *argv[2];PCREATESTRUCT pcrst; /* Creation Structure */
                                         /* Pointer */
    pcrst = (PCREATESTRUCT)PVOIDFROMMP(mp2);
    argv[0] = "lbl=This is the next best thing to sliced bread!
        Toast, toast, toast, butter, jam, toast, marmite, toast.";
    argv[1] = "speed=4";
    jeAppletInit(&hApplet, 1, hWnd, "file:", "Blink.class",
        pcrst->cx, pcrst->cy, 2, argv);
    WinSetWindowPos(jeHWNDFromHandle(hApplet), HWND_TOP, 0L, 0L, 0L,
        0L, SWP_MOVE | SWP_SHOW);
}
break;
```

which contains the HTML script for one of the Java toolkit samples. The applet consists of three distinct elements: class, size, and arguments. The class is defined through the code tag (**code="Blink.class"**). The size is defined through the width and height tags (**width=300 height=100**). The position is not controlled by a parameter but is instead controlled by the owning application or browser. Finally, the parameters are defined through the param tag (**param name=speed value="4"**). You can specify more than one parameter simply by repeating the tag over and over again.

Now, in Listing 3, you can see how the same applet was specified using the **jeAppletInit** API. First, we create an argument vector containing the param tags. Here we create a single text string in the form of **name=value**, which is similar to the param tags but without the **name=** and **value=** tags. You need to create as many text strings as would be needed to describe all of the param-

eters that you are passing to the applet. The values, of course, are applet-specific.

If you want to place the applet in a specific location within your application, you first need to get the window handle of the applet by using the **jeHWNDFromHandle** API. The window handle returned can then be used in calls such as **WinSetWindowPos**. Note that you don't size the applet in **WinSetWindowPos** but through **jeAppletResize**. And, once you've loaded the applet and initialized it through **jeAppletInit**, you can execute it by simply calling **jeAppletStart** with the applet handle returned through the **jeAppletInit** call.

The really cool thing is that you can run other people's Java applets right in your own applications, meaning that you can be part of the Java revolution without really having to learn Java. Pretty neat eh?

Figure 1 shows the simple PM application we created to load the Java Blink applet. Took us all of an hour to write. 

Acknowledgements

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Resources:

You can download *javasamp.exe* from these electronic sources:

CompuServe's *OS2AVEN* forum (*OS/2 Magazine* Section).

File area 11 on the IBM PCC BBS, (919) 517-0001, OS/2 Tools section on the OS/2 BBS for IBM TALKLink customers.

FTP to *prominare.com* and log in as anonymous. The source is located in the */pub/prominare/guicornercodecache* subdirectory.

Visit the GUI Corner home page at www.prominare.com/prominare/os2mag.vol4num1.html.

The Year of the Net Wars

BY ROGER SESSIONS



You didn't watch the Superbowl. You slept through the Olympics. You forgot about the presidential debates. But there is one melee nobody could have missed. 1996 was the year of the Net Wars.

To be sure, this war isn't settled and probably won't be for at least another year. However, the opening skirmishes were mean, and the first victims have already fallen.

As usual, we have Microsoft on one side. As usual, we have most of the rest of the world on the other. As usual, IBM is not entirely sure what the game is about, but they heard it's going to be fun and don't want to be left out.

It's tempting to dismiss the Net Wars as a Microsoft ploy to take over the world, but the truth is more complex. This war is really one of two competing visions of what the Internet is all about. Both visions are compelling. Both have serious weaknesses.

The Microsoft opposition is led by Netscape and SunSoft. Netscape produces the highly successful Web browser, Netscape Navigator. SunSoft produces Java, a new programming language that has taken at least the book publishing industry by unprecedented storm.

In the Microsoft vision, the Net is a logical extension of the operating system. Because everybody will be using the same operating system (guess which), the rest of the issues are unimportant. A Web browser is a relatively uninteresting application, one of many used to find documents and start up programs that live someplace on the Net.

In the Netscape/SunSoft vision, the operating system is merely a support mechanism for the Web browser.

Since everyone will be using the same Web browser (guess which), the underlying operating system really doesn't matter. Programs will be written especially for the Web browser and will therefore run on any machine on which the Web browser runs.

IBM's strategy is simple: The enemy of my enemy is my friend. Therefore, whatever Netscape and SunSoft decide is fine with IBM.

Three main fronts exist on which this war is being fought. They are all interrelated, and it is difficult to look at any one in isolation. These fronts are:

- programming language
- scripting language
- Web browser.

Programming language

In this arena, it's Java, representing SunSoft/Netscape, versus ActiveX Controls, representing Microsoft.

Java is a new programming language. It is object-oriented, compact, and interpreted. It is derived from C++, but much easier to use.

Because Java is interpreted, a Java program can run on any machine that supports the Java interpreter. And because the Java interpreter is highly portable, it is available for just about every machine type. Java programs do not have to be recompiled; they are simply downloaded and run. There is absolutely no difference between a Java program for UNIX and a Java program for OS/2.

Java's "download and run" capability is an essential part of the SunSoft/Netscape "who cares about the operating system" philosophy. It is also an attractive concept to any soft-

ware vendor that would like to support a single product that can be run on any machine.

There are two basic categories of Java interpreters. One category is an interpreter designed for running stand-alone Java applications. The other interpreter is designed for running mini-applications under the control of a Web browser. These Web-based mini-applications are called *applets*. The programming model for applets is slightly different from the one for applications, but with care, a programmer can write Java code that will run both as an applet or as an application.

Microsoft doesn't think developers want to start writing in a new language. They believe there are plenty of applications already written in C and C++, the standard languages for most software developers.

What Netscape/SunSoft call an applet, Microsoft calls a component. Microsoft believes that it already has a widely accepted model for developing components, and that model is OLE (Object Linking and Embedding). OLE describes how an application can be written as a component. Components have well-defined mechanisms for interacting with each other, including the ability to run as an embedded component within another component, such as a Web browser. OLE components are typically written in C++ and must support specific methods defined by OLE.

OLE doesn't support linking across the Internet. Microsoft has added extensions to include this support. An OLE component that supports these extensions is said to be an ActiveX Control. Microsoft believes that any

serious application is already written as an OLE component, and with minimal modification, can be turned into an ActiveX Control. Why, it asks, would anyone want to totally rewrite their application in a new, unproven language?

Of course, ActiveX components, unlike Java applets, are going to be operating-system-specific. You can't take code compiled for Windows and run it on a Macintosh. But Microsoft doesn't see this as an issue. Windows is the only real operating system, it reasons, so why would anyone want to run code anywhere else?

So the language front boils down to these issues.

ActiveX provides a logical upgrade path from OLE and offers the best support for traditional programming languages, such as C++. Any number of applications can serve as a host to an ActiveX Control. However, these applications can only be run on one operating system.

Java is a new language that allows the development of machine-independent applications. It is designed to be simple. It does away with many of the complexities of C++. A Java applet can be run on any number of operating systems. However, existing apps must be rewritten in a new language.

Scripting language

HTML (Hyper-Text Markup Language) is a well-accepted standard for describing the layout of documents. When you download a page to your Web browser, you are really downloading an HTML file. This file is then interpreted and displayed as a Web page by your browser. HTML is supported by both Netscape Navigator and Microsoft Explorer.

Web page designers have long wished to extend HTML with some rudimentary programming capabilities. These capabilities would allow processing that is now done on the server to be moved to the client, where it can be done much more efficiently.

Both Microsoft and Netscape/Sun-

Soft have proposed HTML extensions called *Scripting Languages*. Scripting languages are mini-programs embedded directly into an HTML file. Needless to say, Microsoft and Netscape/SunSoft do not agree on what this scripting language should look like.

There is one little-noticed technical area in which Microsoft and Netscape/SunSoft have gone in different directions.

Microsoft thinks that any scripting language should be based on some well-established script-like technology. By an incredible coincidence, Microsoft happens to have just such a technology available. It is called Visual Basic. The scripting language it proposes is VBScript, for Visual Basic Script, a straightforward extension of Visual Basic. This path, Microsoft argues, allows the many developers familiar with Visual Basic to make an easy switch to HTML programming.

Of course, in the Netscape/SunSoft view, real programmers don't use Basic. Nobody, they argue, will want to use a derivative of—snicker, snicker—Basic when we have a modern programming language like Java available. Therefore, the scripting language should be one derived from Java: JavaScript.

Many of the arguments about JavaScript versus VBScript are old dogs in new costumes. Are object-oriented languages better than procedural languages? Which are easier to learn? Which are easier to maintain? In which style are most existing programs already written? You get the picture.

Web browser

The most visible front of the Net Wars is the battle over the Web browsers. Microsoft offers Internet Explorer. SunSoft/Netscape offer Netscape Navigator. Much ink has been spilled comparing these two. Which is faster? Which is better integrated with other Web tools? Which is more expensive?

In reality, none of these issues matter much. Most articles are missing the basic point of the war.

In reality, Microsoft doesn't care about selling Explorer. It cares about getting rid of Netscape and eliminating its dangerous vision that the Web

browser, rather than the operating system, is the top of the GUI heap. The Microsoft plan is to have Explorer beat Netscape, and then morph Explorer into the operating system.

Netscape/SunSoft has an initial lead in the browser field.

They are using a three-prong strategy:

- get Navigator out to as many sites as possible, to as many machines as possible
- take advantage of the widespread interest in Java as a development language for creating applets
- encourage as many people as possible to develop applets.

Microsoft is running a close second, much too close for Netscape/SunSoft's comfort. Microsoft is using a four-prong strategy to win on the browser front:

- give Explorer away free
- support all of the capabilities of Navigator including Java applets and JavaScript
- extend these capabilities with ActiveX components and VBScript
- encourage Web sites to take advantage of the Explorer-specific capabilities.

There is one little-noticed technical area in which Microsoft and Netscape/SunSoft have gone in different directions. This area is one that is likely to have a major impact on the evolution of the Net, and yet is hardly ever discussed. This area is security.

Security is a significant issue when people are downloading software from the Net. How can one be sure that the software being downloaded is trustworthy?

Netscape/SunSoft build their security into Java and the Java interpreter. They've removed features

from the language that historically have been a favorite tool of hackers—these features, say Netscape/SunSoft, are unnecessary anyway due to the simplicity of Java. They have also restricted what a Java applet is allowed to do while running under Navigator.

The most significant restriction enforced on Java applets by Navigator is the ability to read and write local files. Netscape/SunSoft rightly believe that if arbitrary applets can be downloaded from who knows where and allowed to read and write local files, then the possibility for malicious netplay is unlimited.

On the other hand, this restriction makes it almost impossible to write a serious application. How many real applications do not need to store data in files?

Microsoft has made a different choice. In its security model, every ActiveX control is assigned a unique, secure ID code. Given a control, one can determine its ID code. This code cannot be forged. The system administrator registers the ID codes of trusted components within the operating system.

When a component is about to be downloaded from the Net, its ID code is checked against those the operating systems trusts. Only trusted components are allowed to be downloaded. Once you download a trusted component, you allow it to do whatever it wants, include read and write files. After all, you trust it.

The Microsoft security mechanism allows much more robust controls to be downloaded. Controls can do all of the things we normally associate with OLE components and real applications. However, a system administrator must decide in advance that a particular control is trustworthy.

The Netscape/SunSoft security mechanism allows Java applets to be downloaded from anywhere. The person writing a Web page can write any Java applets the page needs, and ensure they are downloaded as needed. The system administrator doesn't have to decide in advance which applets will be allowed to run. The browser doesn't have to worry about what the applets will do, because Navigator won't allow them to do anything dangerous. However, the applets

will be very limited—one might even say, crippled, in functionality.

The wild card

There is one wild card in this whole game that is worth considering. This card is thrown in by Oracle Corp., a company better known for its relational database products.

Oracle envisions a network-specific computer, nicknamed NC (Network Computer). This computer will be extremely cheap and very limited in functionality. In fact, about all it will be able to do is run a built-in Net browser. It won't have to worry about reading and writing to local disks, because it won't have any. Any data it needs will be downloaded across the Net.

This vision is highly compatible with the Netscape/SunSoft view of the world. For this machine, the browser is the operating system. Nothing could please Netscape/SunSoft more.

Oracle believes NCs, at a cost of a few hundred dollars, will become as ubiquitous as telephones. If this vision becomes reality, Netscape/SunSoft will have gained a powerful ally.

Final thoughts

No one knows how the Web will evolve over the coming year. Will it become a seamless extension of the operating system, or will it replace the operating system? Will it be used for running large applications or small applets? Will the new world of applications be written as minor extensions of OLE, or will they be written in a brand new programming language that barely existed a year ago?

All we know for sure is that we live in interesting times. The best thing to do is to sit back and dodge the bullets.

Books on these topics

The Java Programming Language by Arnold and Gosling (Addison-Wesley). A good introduction to the basic Java language. The problem with the book is a lack of information on the AWT (GUI) toolkit. Recommended.

The Java Tutorial by Campione and Walrath (Addison-Wesley). This book was originally written as a hypertext-linked HTML document. A

lot of good information is here, but the attempt to maintain its hypertexted lineage is very annoying. It is also highly biased towards applet rather than application development. Not recommended.

Core Java by Cornell and Horstmann (SunSoft Press/Prentice Hall). A good, comprehensive book, with especially effective coverage of the AWT (GUI) toolkit. Biased towards applications rather than applets. Recommended.

Java in a Nutshell by Flanagan (O'Reilly and Associates). This small reference book is indispensable. You will use it many times each day to find some obscure method and look up some class hierarchy. Not good for learning Java, but great once you know it. This book never leaves my knapsack. Highly recommended.

The Java Application Programming Interface, Volumes 1 and 2, by Gosling and Yellin (Addison-Wesley). Similar to *Java in a Nutshell* as far as library coverage, but much more extensive. Good for your bookshelf. Recommended.

The Java Language Specification by Gosling, Joy, and Steele (Addison-Wesley). This book contains the formal definition of the language. A necessity for people implementing the Java language and others who have absolutely no real life. Otherwise, not recommended.

JavaScript by Flanagan (O'Reilly and Associates). A good overview and reference book for JavaScript. This book is about the beta version, so things will change. Recommended.

Presenting ActiveX by Ernst (Sams Net). A high-level overview of the Microsoft strategy with ActiveX. Not much information for the hard-core techie, but there isn't much out about ActiveX. Recommended. **OS/2**

Roger Sessions teaches and consults on object technology. His books include the recently published Object Persistence—Beyond Object-Oriented Databases. Roger also publishes the OS/2 Objects Home page (<http://www.fc.net/~roger/owatch.htm>). He can be contacted at roger@fc.net.

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Marketplace

Interactive Disassembler Pro 3.5

Native 32-bits multi-threaded OS/2 application, interactive auto-commenting disassembler, handles all OS/2 executables, dlls, drivers, ifs and more; also supports DOS, NE, LE, PE LX, NLM, Binaries, ROM and more; 80x86, Pentium, MMX, Pentium Pro, 68K, Z80 and more; functions, arrays, structures, interactive C like internal language, **don't believe us, try !**

sample disassembly below

```
call DosSetExceptionHandler
mov eax, offset CPPO830_matherr
call CPPO830_exception_proclnit
mov eax, [esp+20h]
call sub_109E4
push 109ACh
push 0FF01h
call DosExitList
call sub_109DC
push 10000h
mov ecx, large dword ptr ds:CPPO830__environ
sub esp, 0Ch
mov edx, dword_203AC
mov eax, dword_203A8
call CPPO830_callback_opt_sys
call CPPO830_exit
```

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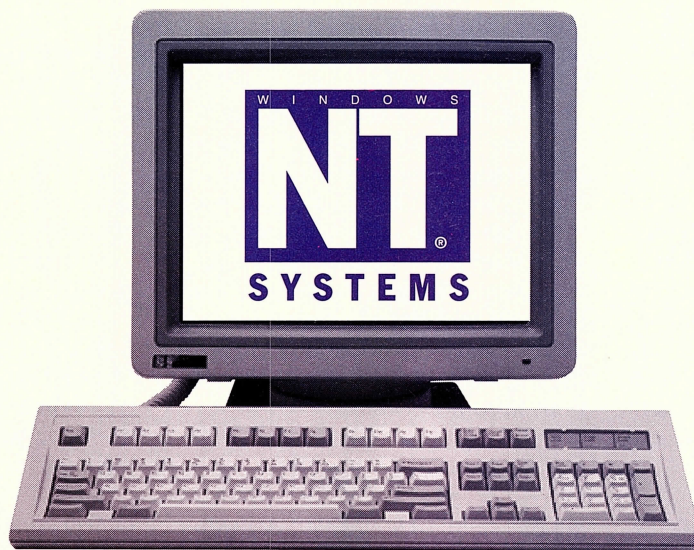
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A Final Salute

BY BRIAN PROFFIT

Since the first issue of *OS/2 Magazine*, I've shared my thoughts on literally dozens of OS/2 products. In general, I've tried to select products that had a fairly broad appeal or strong name recognition. At times, I've covered some relatively obscure products if their value seemed high enough. But there is a vast collection of products, both shareware and freeware, that are worth noting—even though I haven't been able to give them the full attention I usually spend on an individual test drive.

IBM's marketing plan for OS/2 Warp 4.0 seems to indicate that new product development for OS/2 will become polarized. At one end will be corporate applications, designed and written within an enterprise to meet its specific needs. At the other end will be the shareware programs and utilities that those who have loved and labored over OS/2 for so long will continue to develop and use. As for the middle products, general commercial applications...well, some will continue, while many others will follow DeScribe Inc.'s footsteps into liquidation.

So as I write the final pages of what has been an exciting chapter in my life, I would like to recognize some of those smaller, lesser-known products. Many of these were developed by people in their dens in the evening playing with an operating system they love. These products aren't as dependent upon IBM's marketing plan and are thus likely to continue to take care of OS/2 users for quite a while.

Rather than list specific download

locations for each package, I suggest that you look for these and hundreds more in the OS/2 section on America Online, the OS2SHARE forum on CompuServe, the Hobbes and Walnut Creek sites on the Internet (*hobbes.nmsu.edu* or *ftp-os2.cdrom.com*), the OS/2 Must Have Utilities page (<http://www.hammer.org/OS2>), or Pete Norloff's OS/2 BBS (telnet to 703.385.4325). I have included file names for the packages, but you may find variations in some locations.

Development Aids

MakeIPF (*makeipf.zip*). A flexible online help (.ipf) file generator. Allows you to use simple tags to mark up text and creates the online help. Includes support for linked pop-up windows (footnotes), multiple windows, multiple fonts, embedded bitmaps, and more.

REXXAsync (*rsasync.zip*). A great collection of REXX functions for asynchronous serial communications. More than 40 routines covering all aspects from Data Carrier Detect (DCD) processing to xon/xoff flow control processing. The only documentation is the set of comments in the C source, so this product isn't for the async novice. However, it is a great tool for automating communication tasks through REXX programs.

REXXBase (*rxbas210.zip*). A collection of functions that allows you to create, read, write, and update dBASE files from OS/2 REXX programs. Works with REXX and Object REXX, as well as the commercial REXX development packages like Personal REXX, VX-REXX, and VisPro REXX.

REXXLib (*rexlib.zip*). A collection of over 150 valuable REXX functions. A variety of useful tasks, including compound variable handling (favorites include the ability to sort arrays and read/write them to disk), interprocess communication, additional math functions, access to OS/2 services, and text mode I/O.

REXXMath (*rexmath.zip*). A free-ware set of REXX functions for mathematical calculations. A complete set of trigonometric and other math functions in a small (27K) DLL. C source is included.

SOMXBase (*smxbs.zip*). A System Object Model (SOM) class providing access to dBASE III and IV tables. The xdbf class includes several database manipulation methods.

Games

Aquanaut (*aquanaut.zip*). Aquanaut is an arcade-style game in an underwater setting, complete with spitting seahorses and reproducing octopi to blast.

Boggle (*boggle.zip*). Based on the letter-dice game, this program presents a random collection of letters. Players are challenged to locate as many words as possible in a given period of time using adjoining dice.

Bummer! (*bummer.zip*). OS/2 version of the board game Sorry. Plays well, but is hard-coded to require a resolution of 800x600 or higher.

Card Games for OS/2 (*fmcrd311.zip*). A well-done collection of solitaire games. Excellent graphics and playability. Caution: addictive.

Entertainment Pack (*entr27.zip*). A collection of games—board games

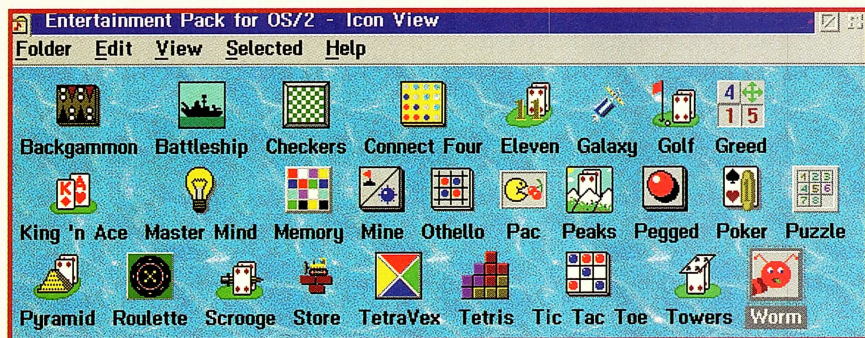


Figure 1: The Entertainment Pack provides enough variety to avoid work for hours.

such as Backgammon, Othello, Mastermind, Pegged (pegboard solitaire), multidimensional Tic-Tac-Toe, and Drop Four, in addition to card games and more. Simple and timeless strategy games with a challenging computer opponent.

Matrix (*matrix12.zip*). A thought-provoking strategy game that pits you against the computer arranging colored tiles for maximum points. As you take turns placing tiles on a square grid, you get points for creating certain patterns—but you also want to avoid making it easy for your computer opponent to create those patterns.

binary files through the Internet. C source is included. The EMX run-time library (also available as freeware) is required. Especially valuable because IBM inexplicably hasn't added this support to NewsReader/2.

Page (*page11a1.zip*). I mentioned HTML Wizard and WebWriter/2 because everyone's taste differs. To me, though, Page is the best shareware Web page creation tool available for OS/2. It uses a graphical toolbar and pop-up menu to allow easy selection of the desired tags for Web pages. Includes support for tables and forms, and a syntax checker that can un-

cover many errors. Integrates with WebExplorer for quick visual verification of the page being created.

PMUUE (*pmuue120.zip*). PMUUE is a utility for converting files to (UU-encode) or from (UUdecode) UUE format for transmission over the Internet. Like MIME64, this fills a glaring void in IBM's bundled OS/2 Internet products.

Strip (*strip20.zip*). When you save Web pages as files, they're difficult to read with all the embedded HTML tags. This utility removes the tags, leaving just the plain text. Also works with online help (*.ipf*) files.

WebWriter/2 (*webwrite.zip*). WebWriter/2 is a good HTML-based Web page development tool. Full HTML 2.0 support, plus many HTML 3.0 tags including forms and tables.

WebXplorer Organizer (*webxorg.zip*). Allows you to organize the entries in your WebExplorer QuickList or your Netscape Navigator Bookmarks into your own home page. It sorts your entries alphabetically and allows you to organize them into folders and subfolders. From that organization, it creates a file that serves as your home

Internet

FTP Monitor (*ftpmn12a.zip*). A program to monitor FTP sites, FTP Monitor lets you know what new files have arrived. Input the site and directory to monitor, and it keeps track of files you have seen. When you activate the program, it scans the site and lists new files. You can then view or download them from within FTP Monitor. Doesn't integrate with the IBM dialer or FTP-PM.

HTML Wizard (*htmlwiz.zip*). An HTML editor, HTML Wizard simplifies the creation of Web pages. Includes a separate "tag bar," a toolbar with buttons for dozens of HTML tags. Doesn't include support for frames, but it does support just about everything else the amateur Web page designer could want.

MIME64 (*mime64.zip*). A freeware command-line-based MIME64 encoder/decoder for sending Base64

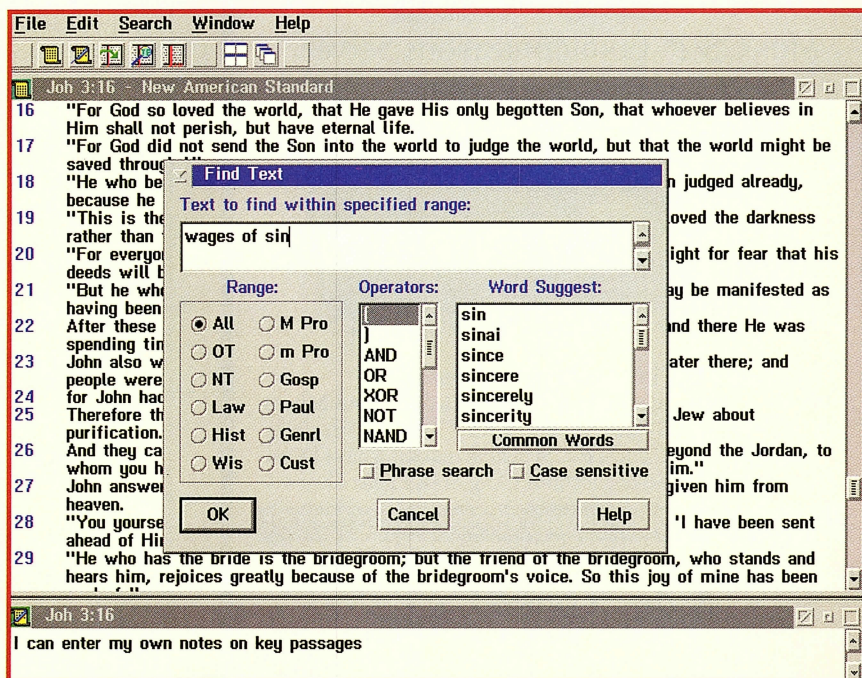


Figure 2: CODEX includes a simple, yet powerful, search engine.

Test Drives

page. When you load WebExplorer or Navigator, that home page is loaded from your disk, with hyperlinks in place to allow you to move to your favorite URLs directly.

Multimedia

AnPoCodec (*apcd3.exe*). Codecs to let you play Video for Windows, RLE, or Cinepack movies under OS/2.

MidiLab/2 (*mlabv303.zip*). MidiLab/2 is good MIDI recording and editing tool with a surprising amount of function for a shareware package. Support for externally controlled devices included.

Religion

CODEX Bible Concordance (*bible.zip*). The CODEX Bible Concordance offers phrase searches or word searches with Boolean (AND/OR) operators. Comes with or without the full King James Version text of the Bible.

CODEX New American Standard Bible (*nash_10.zip*). The full New American Standard Bible text for use with the CODEX Bible Concordance.

God's Word for OS/2 (*gw20wp.zip*). This product is a complete Bible study package with the King James Version text, plus Greek and Hebrew lexicons attached with Strong's numbers. Includes a Bible dictionary, plus a commentary and topical index. You can highlight favorite passages in four different colors and record your own notes for each verse.

Recovery Bible for OS/2 (Modern Language, *rbibowe.zip*; or King James Version, *recbibod.zip*). This version of the Bible is specifically indexed and annotated for those recovering from addiction. It works hand-in-hand with 12-Step programs, including prayers for each of the steps and appropriate color-coding of passages in the Bible.

WordWise Daily Scripture Calendar (you need *ww_os214.zip*, the OS/2 executable, plus *ww_pac.zip*, the platform-independent data module).

WordWise provides daily scripture verses in any of several translations and daily Bible reading suggestions

Utilities

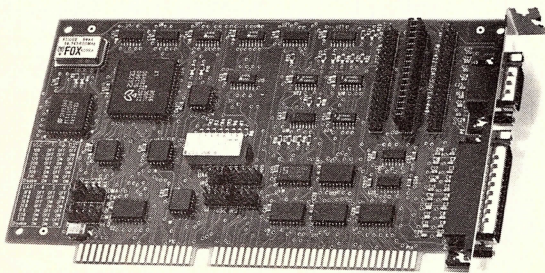
Characters (*charcs.zip*). Characters is a freeware product similar to Windows' Character Map. It displays a PM notebook containing more than 90 entries in your code page that can't be selected directly from the keyboard. Line-drawing characters, the copyright symbol, special characters from other languages, and more can be copied to the clipboard with a mouse click and then pasted into your application.

Data Encryption for OS/2 (*des_os2.zip*). This product is a freeware OS/2 implementation of the Data Encryption Standard. Easily encrypt your files for high security. Command-line based, with no graphical interface. C source code included.

FindYourFiles (*fyf.zip*). Here's a fantastic command-line-based file finder. It allows searches across one or more

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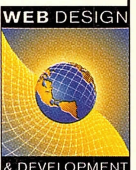
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drives, and for one or more file types. Even searches within ZIP or LZH archives. For example, to locate all files on drives D: or E: that are executable or command files, you could use the search string DE:\[*.*EXE,*.*CMD]. If you're not sure of a file's name but think it is something like LETTER, you could use a fuzzy search like ~LETTER to locate all file-names that "sound like" LETTER. You can get even more precise by searching for specific text within files using regular expressions.

FlexText (*fltxt.zip*). FlexText is a print utility for text files. Allows large reports to be printed more economically by condensing the print so two pages appear side-by-side on one sheet in landscape format, or by simulating a duplex printer by printing every other page, pausing so you can reload the paper with the opposite side up, and then printing the alternate pages.

FM/2 (*fm2_250.zip*). FM/2 is a complete file management package, with functions as diverse as HPFS partition defragmenting and extended attribute viewing. Fills in many blank spots in the Workplace Shell.

Galleria (*galler.zip*). Galleria is the screen capture/image manipulation package I used to capture virtually all of the screen shots accompanying "Test Drives." Easy screen capture and good editing ability. Supports many formats, including PhotoCD.

GetIt (*getit.zip*). A file finder that allows you to search for files containing specific text strings—even within your word processing documents. Selection is based on file name or date criteria, as well as extensions. Can locate words/phrases in plain text search or Word Perfect, Word, Clearlook, Ami Pro, Word Pro, and Rich Text Format (RTF) documents.

IHPFS (*ihpfs122.zip*). IHPFS allows read-only access to HPFS partitions when DOS is booted.

McAfee Virus Scan (*osc_202.zip*). A good virus scanner, available as shareware. Many other shareware products integrate with it due to its wide availability.

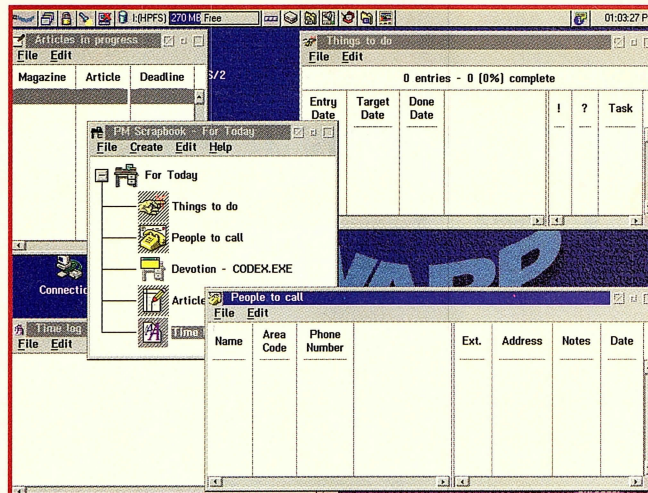


Figure 3: PM Scrapbook helps you organize just about anything.

Personal Inventory Gatherer/2 (*pig_14.zip*). Extremely useful program for keeping track of personal items, including manufacturers, serial numbers, purchase date and price, place of purchase, estimated replacement cost, warranty information, and pictures (with your existing graphic viewer program) of scanned images. Items can be grouped by category. This program could be worth hundreds of times its cost in the event of a disaster for itemizing your possessions to an insurance company. You can also track insurance carriers and policy numbers.

PM Scrapbook (*pmsb28.zip*). This wonderfully useful little information organizer allows you to create to-do lists, address books, notes to yourself, and even database tables, and to then organize all of these hierarchically. Allows you to include pointers to OS/2 objects as well. Its simplicity makes its utility surprisingly broad.

SIO (*sio157.zip*). SIO is a set of asynchronous communication device drivers that replace OS/2 *com.sys* and *vcom.sys*. Since these drivers were first released, they have been the first suggestion that anyone, including IBM technical support, makes to someone having a communication problem. Almost guaranteed to speed up your serial communication and make it more reliable. Supports speeds up to 115,200bps.

SpellGuard (you'll need *splgrd.zip*, the executable, plus *spdict.zip*, the dictionary). This product is an on-the-fly spell checker that isn't application de-

pendent. Now get accurate spelling in all programs, not just your word processor. Works for Presentation Manager applications, as well as OS/2 and DOS command windows.

ZipControl (*zipct230.zip*). Graphical front end to ZIP and UNZIP. Very flexible and can integrate with your existing virus-scanning software to automatically check files as they are extracted. Makes archive management much simpler. You can extract individual files or open/view files without extracting them.

ZIP/UNZIP (*zip201.exe* and *unz512.exe*). Freeware utilities to compress/decompress files in PKZIP-compatible format. ZIP/UNZIP supports OS/2 extended attributes but doesn't allow multivolume archives (that is, more than one floppy disk).

Glee or flee

All of the items listed here should bring some measure of glee, or they wouldn't have been included. As either freeware or shareware, it costs you nothing to give them a try. Please support shareware vendors by registering the products you decide to keep. If you hate the "pesterware" techniques that developers stick in their shareware to encourage you to register, and I know I certainly do, the only way to get rid of them is to convince developers that everyone is honest enough to register the products they use.

A final note to those vendors over the years whose products received a "flee" recommendation—I hope you considered it an encouragement to improve your product rather than a personal attack.

OS/2

Brian Proffitt left IBM's OS/2 team to become director of PC Week's Corporate Labs. He is now president of Visionary Research, contributing editor for Computing Today magazine, and solutions advisor to PC Magazine. Brian can be reached on the Internet at 75300.1466@compuserve.com.



Identifying Places and Things

BY DICK GORAN

Where am I / what am I?

With many OS/2 users moving to OS/2 Warp 4.0, the need may exist in your REXX programs to determine a number of system-related variables. The most obvious of these is from what version of OS/2 your program was launched. The simplest way to differentiate the OS/2 version is using the **SysOS2Ver()** function in the REXX-UTIL Application Programming Interface (API). The values returned by **SysOS2Ver()** are shown in Table 1. As the table shows, both classic REXX and Object REXX on OS/2 Warp 4.0 return the same value. Therefore, the **PARSE Version** instruction must be used to further identify the operating environment. Classic REXX will return a value of 4.00 as the second word, whereas Object REXX will return a value of 6.00. I suggest that the date returned by the **PARSE Version** instruction not be relied upon as I have seen this change in the classic REXX world with various maintenance releases.

The long-awaited boot drive function was put into the Object REXX version of REXXUTIL as **SysBootDrive()**, but is of little consolation to classic REXX programmers. The ability to determine the boot drive exists in other APIs. **REXXLIB** (commercial) always had the **DOSBOOTDRIVE()** function. **RXU** (free), written by Dave Boll, in-

cludes the **RxQuerySysInfo()** function, which has a rather obscure way of identifying the boot drive. This obscurity is not Boll's doing—he provides a pass-through to the **DosQuerySysInfo()** system function. The boot drive is returned as an ordinal number that can be converted into its corresponding drive letter (1–26 = A–Z).

OS/2 Warp 4.0 and OS/2 Warp 3.0 Connect contain an undocumented API, **RLANUTIL**, that contains the **GetBootDrive()** function, which returns the boot drive letter in upper case followed by a colon. The function must be individually registered using the **RxFuncAdd()** function. For example:

```
call RxFuncAdd 'GetBootDrive',,
               'RLANUTIL',,
               'GetBootDrive'
boot_drive = GetBootDrive()
```

Other techniques to determine the boot drive can be used without relying on external APIs. Some that I have seen used are naive, because they are predicated on flawed rationale. For example, the IBM Warp 3.0 Bonus Pack *install.cmd* assumed that the boot drive was indicated by the drive letter and colon that immediately preceded the first occurrence of **\OS2** in the **PATH** environment

variable. This worked well on systems without custom directories that began with the characters **\OS2** and that were placed ahead of the system's **\os2** directory. It won't work on any OS/2 systems in which I have added a directory, **\os2addon**, that I intentionally want to appear in the search path before the default system directories.

For a long time I recommended that the environment variable **RUNWORKPLACE**, which normally points to **?:\os2\pmshell.exe**, be used to determine the location of the boot drive. A program named **FILEBAR**, however, apparently changes this value. Therefore, when I want to determine the boot drive without using an external API, I use the following:

```
parse upper value VALUE(,
               'PATH',,,
               'OS2ENVIRONMENT' ) with
               '\OS2\SYSTEM'      -2,
boot_drive = VALUE               +2
```

This does have a dependency on the **\os2\system** directory remaining on the boot drive, but I doubt that will change in the near future.

Classic vs. Object REXX

The **PARSE Version** instruction is used

Table 1: **SysOS2Ver()** values.

Version	SysOS2Ver() returns
Prior to Warp 3	2.10
Warp 3 (Red, Blue, Connect)	2.30
Warp 4 (Classic & Object)	2.40

Table 2: **PARSE Version** values.

REXXSAA	4.00	11	Nov	1994	(PCDOS 7.0)
REXXSAA	4.00	08	Jul	1992	(Pre Warp 3)
REXXSAA	4.00	10	Feb	1994	(Warp 3)
REXXSAA	4.00	24	Aug	1996	(Warp 4)
OBJREXX	6.00	12	Jul	1996	(Obj)
REXX/Personal	4.00	12	Oct	1994	

to determine whether you are running under classic REXX, Object REXX, or any alternate version of REXX such as Personal REXX from Quercus Systems. The values returned for each version are summarized in Table 2.

File name vs. file extension

With access to other file systems via the Internet, some attention is warrant-

ed in the discussion of parsing, or separating, a file name from its optional file extension. According to *OS/2 Warp 4 Unleashed*, "Under the 8.3 naming convention, the extension is the 1 to 3 characters following the period. Under HPFS, if the file system name contains one or more periods, the characters to the right of the rightmost period comprise the file extension." Fragment 1

shows a technique for extracting the file name and optional extension from a full file system name, which is valid for all file systems. The code fragment uses a file system name that is found on an OS/2 Warp 4.0 system with the optional Java installed.

DosQuerySysInfo()

The `DosQuerySysInfo()` function is an

Table 3: Data available with `RxQuerySysInfo()`.

1. Maximum length, in bytes, of a path name.
2. Maximum number of text sessions.
3. Maximum number of PM sessions.
4. Maximum number of DOS sessions.
5. Drive from which the system was started (1 means drive A, 2 means drive B, and so on).
6. Dynamic priority variation flag (0 means absolute priority, 1 means dynamic priority).
7. Maximum wait in seconds.
8. Minimum time slice in milliseconds.
9. Maximum time slice in milliseconds.
10. Memory page size in bytes. This value is 4096 for the 80386 processor.
11. Major version number.
12. Minor version number.
13. Revision letter.
14. Value of a 32-bit, free-running millisecond counter. This value is zero when the system is started.
15. Low-order 32 bits of the time in seconds since January 1, 1970 at 0:00:00.
16. High-order 32 bits of the time in seconds since January 1, 1970 at 0:00:00.
17. Total number of pages of physical memory in the system. One page is 4KB.
18. Total number of pages of resident memory in the system.
19. Maximum number of pages of memory that can be allocated by all processes in the system. This number is advisory and is not guaranteed, since system conditions change constantly.
20. Maximum number of bytes of memory that this process can allocate in its private arena. This number is advisory and is not guaranteed, since system conditions change constantly.
21. Maximum number of bytes of memory that a process can allocate in the shared arena. This number is advisory and is not guaranteed, since system conditions change constantly.
22. Timer interval in tenths of a millisecond.
23. Maximum length, in bytes, of one component in a path name.
24. Session ID of the current foreground full-screen session (full-screen sessions only; PM session has `sessid=1`).
25. Process ID of current (that is, one making this call) foreground process.
26. Number of processors on machine.

The REXX Column

Fragment 1: Parsing file name and extension.

```
/* 9701FG01.CMD - Determine file extension */
file_system_name = 'C:\javaos2\docs\api\java.applet.Applet.html'
file_name_ext    = FILESPEC( 'N', file_system_name )
dot_ptr          = LASTPOS( '.', file_name_ext )
if dot_ptr > 0 then
do
  parse value file_name_ext with,
    file_name =(dot_ptr) +1,
    file_extension
end
else
do
  file_name      = file_name_ext
  file_extension = ''
end
```

API that is available to C programs to extract a wealth of system information about the system on which the program is running. Some of this information is available via REXXLIB; however, all of the information is directly available with the `RxQuerySysInfo()` function in `rxu.dll`. Table 3 lists the information that can be extracted from the object system. RXU is accompanied by `rxu.inf`, which describes how to use the

`RxQuerySysInfo()` function and how the data is returned. **OS/2**

Dick Goran is the author of the REXX Reference Summary Handbook, an OS/2 reference. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients

and lectures on OS/2. His free REXX utility programs can be downloaded from OS2DF1, Lib 6 on CompuServe or FTPed from <ftp://ftp.cfsrexx.com/pub>. He can be reached via e-mail at 71154.2002@compuserve.com.

Resources:

OS/2 Warp 4 Unleashed,
by David Moskowitz,
David Kerr, et al.
(ISBN 0-672-30910-6)
Sams Publishing
(800) 695-8642

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You're probably used to seeing product reviews done in a quasi-formal, laboratory-tested style.

Well, the best tests reflect real-world usage, and that's the story behind this review of Microrim's R:Base 5.5 and R:Web software. It all starts at the Phoenix OS/2 Society Inc. (POSSI), where we serve as volunteer officers. Our challenges: Because the U.S. Post Office changed its bulk mail rules, POSSI needed to make changes to its database. And while we were at it, we wanted to enhance the POSSI Web site (<http://www.possi.org>).

Microrim's promises for R:Base 5.5 for OS/2 and R:Web seemed to indicate that these would be perfect tools for the job. R:Base is a database that uses a true relational model, with serious attention paid to data integrity; this is no lightweight database. It uses SQL and Query-By-Example (QBE) and has an interactive debugger. You can use R:Base databases with multiple users on multiple platforms (it's also available for DOS and Windows 3.1/95/NT). R:Base's GUI uses scroll bars, buttons, and graphics; and we could create quick forms, reports, and labels. Microrim's R:Web converts R:Base forms into a Web page, requiring no knowledge of HTML or CGI. It creates a connection and automatically passes the information back to the database.

We thought it would be nice to combine everything into one package, especially since, as R:Web intimated, it would enable the membership officer to update the database over the Internet.

The user group database isn't trivial. While it has fewer than a thousand records, the database designers created a structure to support the group as it grows to billions of members. (We plan ahead.) It consists of 19 tables, linked with primary and foreign keys, and uses nearly every data type. We use it for membership information, bulk mail label generation, even meeting check-in and door prize dis-

tribution. So this database project reflects a real-world scenario.

The existing POSSI database was programmed using C++, REXX, Hockware's VisPro/REXX and VisPro/Reports, and IBM's DB2/2. To make our software evaluation look a *little* like a lab test, we also tested R:Base with other databases, including a 1,500 record xBase database based on the CompuServe OS/2 Shareware forum library.

Brief overview

In R:Base, an application is made up of databases, which in turn, consists of tables. You ordinarily access tables through views (queries) and data interaction forms that are used to create reports and labels.

You can also view and edit tables in a spreadsheet format, called a Data Browser. One great function of the Data Browser is its ability to form a cross-tabulated view, with which you can perform calculations and ad hoc statistical analysis. Another function is Data Browser's ability to change the sort order of the display by clicking on the column heading. Unfortunately, while you can change the fonts and colors in the Data Browser, it doesn't remember the change from one session to the next.

The R:Base query methodology depends on SQL interaction. It includes tools to help you build queries as you choose tables and columns and specify their sort and selection criteria. We

found it incredibly annoying that right-clicking on the table name (to choose which columns to include, for example) shows the pop-up menu only momentarily; you have to right-click and hold down the mouse button, which is counter to WPS rules (and to our intuition). R:Base is consistent with this inconsistency, and it got on our nerves.

Tables can store all the expected data formats, including currency, notes, and graphics. Columns can be automatically numbered or computed. R:Base supports primary, unique, and foreign keys, as well as data rules (thus requiring data to meet your predefined criteria). Databases can have access privileges assigned, so that a given user can update records but cannot add new ones.

You can use the menu bar in R:Base, but everything is accessible from a notebook called the Object Manager. To create a new database, you fill out tables of information (often requiring you to open more notebooks), changing pages to provide additional information. This is nice, in some ways, but simultaneously annoying. It made us feel as if we were endlessly flipping back and forth, instead of writing on a single piece of paper.

Within R:Base, it's easy to create forms to enter, edit, and display database information. The "quick form" mode works fine for simple projects, but the GUI tools available for creating custom forms are so easy to use that it's worth spending time learning them. You'll find a rich set of push buttons, combo boxes, check boxes, 3D boxes, and other widgets. R:Base's functions for reporting and label creation also provide utility and value. And, if you're a power user or comfortable with command line interfaces, you'll like the availability of the "R prompt."

You can import and export from several formats, including ASCII, 1-2-3, and dBase. You can also attach to dBase databases directly

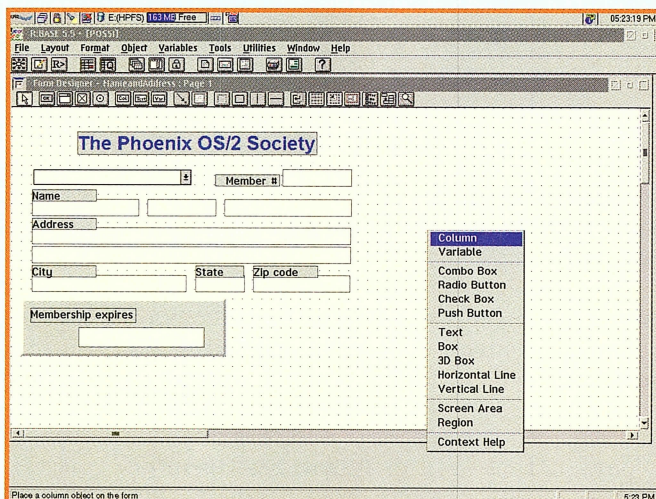


Figure 1: R:Base's form creation gives you a formidable choice of buttons, boxes, and screen controls.

from R:Base. We imported our data from a comma-separated ASCII file and fussed with the different ways DB/2 and R:Base expected dates to appear. Even so, we ran into a problem with the way R:Base's SQL handles null fields. DB/2 treats an empty string as a character string with zero characters. R:Base treats the same string as a null. This wreaked havoc when we tried to import some fields with empty strings into columns that were defined as "NOT NULL."

Life in the real world

Microrim's R:Base documentation is good. It devotes the right amount of time to teaching you how to think about database design, which would be especially helpful if you're new to the subject.

Although a text-only OS/2 R:Base has been available for some time, R:Base still shows its DOS and Windows heritage. Compromises were clearly made to provide cross-platform compatibility, such as limiting the length of file names to the 8.3 convention—only DOS and Windows 3.1 users will appreciate that! As a result, R:Base feels more like a Windows application than an OS/2 application. It uses its own database format (though it can attach to xBase databases) and its own (cross-platform) language, which has no REXX integration. That was a problem for us, because most of the DB2/2 database SQL was embedded in a REXX program.

Also, Microrim's programmers don't seem to be familiar with OS/2 as *users*. The R:Web documentation tells you to edit the R:Web "Generate HTML" program object each time you compile a new set of Web forms. This step is easily circumvented by adding [Enter file name] in the Parameters field in the Settings notebook.

book—but perhaps nobody at Microrim knew that.

We had some installation problems, too. R:Base installed okay...it just didn't work okay. R:Base ran fine on Esther's machine (running OS/2 Warp Connect) and on the OS/2 Warp 4.0 ("Merlin") beta-test system.

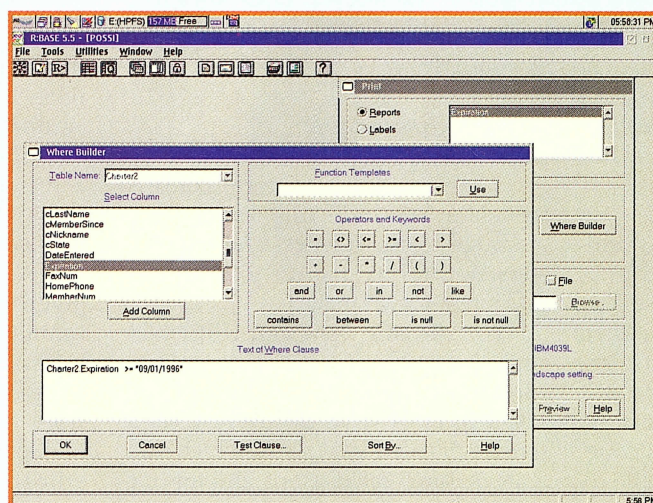


Figure 2: The R:Base Where Builder helps you to create SQL Where clauses without requiring you to learn detailed SQL syntax.

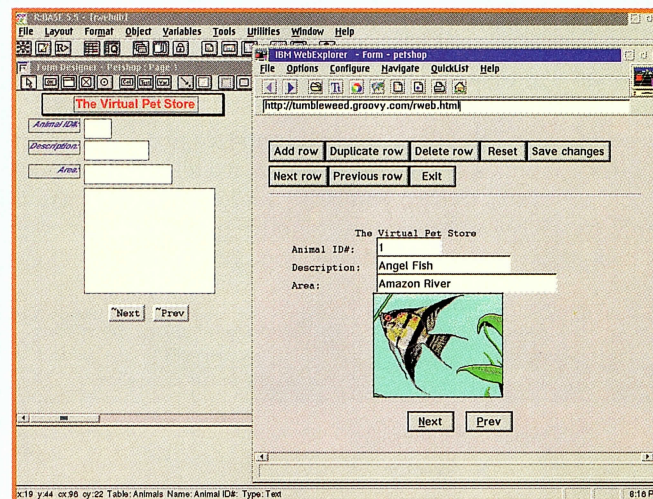


Figure 3: Create a form in R:Base and use R:Web to transform it into a Web page.

On Bill's PC (running OS/2 Warp Connect and updated to FixPak 17), R:Base loaded, then developed a SYS3175 error and stopped executing. In fairness, we're unsure whose fault that was: his system has OpenDoc, DB2/2, a few other databases, and several beta products—and only his WPS shadows know what evil lurks in

the heart of his .ini files. But that doesn't live up to the product's advertised promises of a "rock-solid database solution."

Even on Esther's PC, we found R:Base entirely too unstable, especially over the long haul. It would often vanish in the middle of working with a database; it reported no error but usually corrupted the database. We also ran into bugs, large and small. For example, Bill created the structure for the POSSI database and, after creating a comma-separated file from the DB2/2 database, imported the member data. When he tried to create a form for the database, R:Base crashed. Microrim swiftly provided an update that fixed the problem, but too many "minor" items like this one occurred to keep us from ever warming up to the program.

What about R:Web?

It's really neat to create Web pages without touching HTML, and that's what R:Web offers. It's biggest flaw is its lack of documentation (the R:Web-specific documentation consists of a 24-page "getting-started" pamphlet) and counter-intuitive integration with R:Base itself (the R:Web installation wants to reinstall R:Base even when it's already there).

Once you figure out what's going on, the process of turning databases into Web pages is fairly straightforward. First, create an R:Base database form (unlike

the base version, though, it doesn't automatically connect matching keys). Next, tell R:Web to generate the HTML code. Upload that HTML to your Web site, and you have instant access to your database, with automatically added navigation buttons.

Because no Settings notebook exists, the only way to modify

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R:Web's configuration is during installation, when you're offered the chance to edit the `rweb.ini` initialization file. After several go-rounds, we discovered that it's best to punt and edit the file later. If you try to edit it during installation, you'll quickly discover that you have no documentation for the various settings; the documentation is in a `readme` file. Also, many of the values needed are IBM Internet Connection Server settings, so you'll need to look in the `httpd.cnf` file for those values.

In short, R:Web is excellent for record-by-record browsing of and interacting with a database, but the DB2 Connection Server is much better at displaying the contents of the database; for example, it will let you build a Web page that's a result table. We couldn't find a way to accomplish that task with R:Web.

If only they worked

We like the design of R:Base and

R:Web, and, if they fulfilled their promises, both would be excellent products. The advertising card promises "A rock-solid database solution!" and "...the first easy-to-use, programming-free Internet database solution!" These products have features we wanted, and we liked the way it was all *supposed* to work. Using them in their current state was too frustrating, however; if these were beta products, we'd say "Good start!" But by the end of our real-world project, we had decided to stick with our hodgepodge of existing tools. **OS/2**

Esther Schindler is senior contributing editor at OS/2 Magazine and author of The Computer Speech Book. She can be reached at CompuServe 72241,1417 or esther@primenet.com. Bill Schindler is an OS/2 software developer who writes about OS/2 programming topics. He can

be reached at CompuServe 74774,1420. Bill and Esther recently co-authored Teach Yourself REXX in 21 Days.

Resources:

R:Base (Single user, \$495; LAN pack—five-user network license, \$695)

R:Web (\$495)

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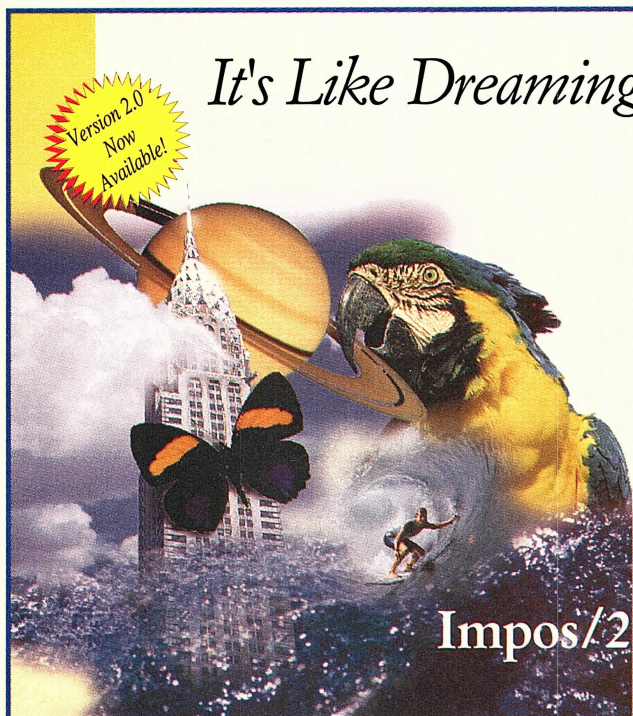
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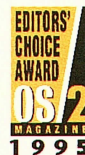
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Why do so many scientists and engineers use UNIX workstations? Because these computers can run powerful numeric and symbolic crunching and graphing packages while running other programs simultaneously. However, large, commercially produced UNIX applications are much more expensive than similar applications for PCs. Therefore, many scientists and engineers have opted to purchase two computers—one for number crunching and the other for word processing, spreadsheets, databases, and other applications.

Today, with OS/2, one can have it all. Enter Waterloo Maple Inc.'s Maple V Release 4 for OS/2, introduced alongside the company's 32-bit Windows version early this year. (Surprisingly, the Macintosh version was released approximately four months later.) For OS/2 users, the question is: Is Maple V for OS/2 a robust and powerful product that's truly Workplace Shell-exploitive, or is it another crippled Windows version, such as Wolfram Research's Mathematica for OS/2?

For this review, I examined the functionality, ease of use, stability, and performance of the Maple V for OS/2 Release 4, and compared it to the Windows version running under Windows 95. The product was used for a number of months under both relaxed and strenuous conditions. The majority of the testing was performed on a 100MHz Pentium-based PC with 32MB RAM running OS/2 Warp Connect. For comparison with Windows 95, a 133MHz Pentium with 32MB RAM was used for both tests.

Introducing Maple V

Waterloo's Maple is similar to the better-known Mathematica in that both are mathematical packages that solve equations symbolically and numerically. The number of functions available are astronomical. Maple tackles calculus, linear algebra, geometry, combinatorics, num-

ber theory, and statistics by solving problems involving differential equations, integrals, special functions, derivatives, and matrices. In addition, Maple can quickly create two- and three-dimensional graphs and maps. Multiple plots can be generated to form animation sequences, which are quite useful in understanding the mathematics of ocean waves or the motion of particles.

Maple also provides its own programming language, which is simple for anyone experienced with REXX or Basic to understand. Most of Maple is actually written using its own programming language, making it easier for Waterloo to port updates from one operating system to another.

Up and running

Both the Windows and OS/2 versions of Maple V come with identical literature. Even the slim installation guide is identical, with a section for the Windows installation and a section for the OS/2 installation. The package also includes a useful learning guide, a programming guide, and a thick, spiral-bound handbook, along with the usual collection of re-

lease notes and license notes. The documentation is a vast improvement to what was provided in previous releases and, in my opinion, superior to what is provided with Mathematica. The handbook is excellent; topics are grouped by function and then listed alphabetically. An index quickly points you in the right direction. While I would normally use this book to refer to less common operations, such as determining the primitive part of a multivariate polynomial, I found Maple's online hypertext help to be so powerful and useful that the handbook was examined less frequently the more I used Maple. This is remarkable, because neither I, nor my colleagues, have previously found online help from any of the mathematical packages to be useful for answering questions.

Maple is installed from either CD-ROM or floppy disk. One of my initial disks contained one bad segment, requiring a second set to be sent to me, and thereby allowing me to test Waterloo's technical support via phone and e-mail. While the e-mail was slow but responsive, the phone support was excellent, and I was treated with

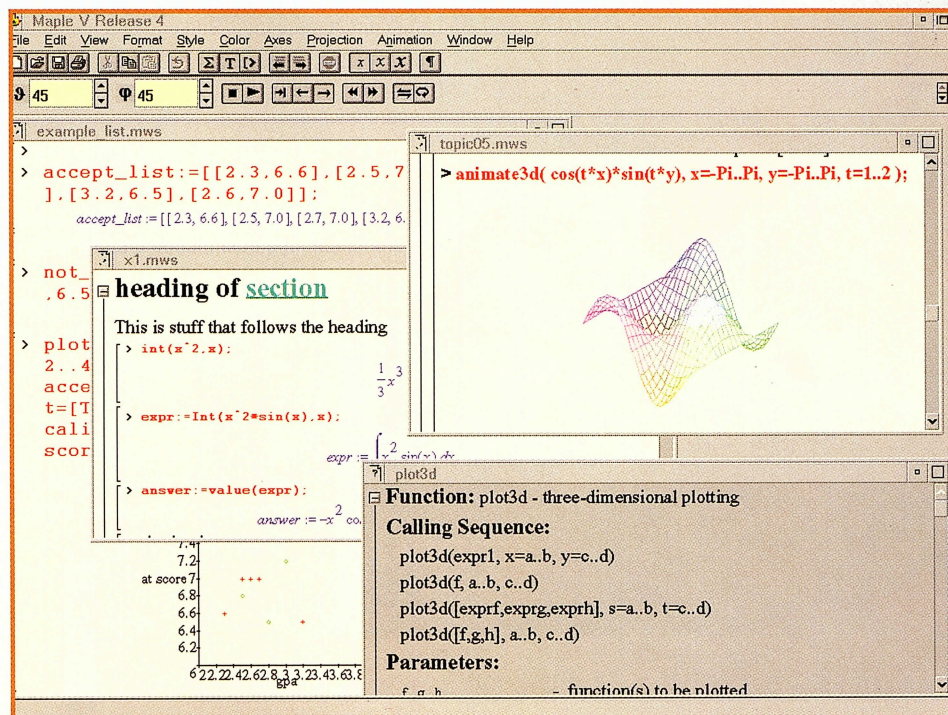


Figure 1: A rich and powerful interface with multiple buttons compliments an impressive mathematical engine.

great respect—even though I was using OS/2. (Other companies have passed me around in their phone systems when I called to discuss the OS/2 version of their products.)

When the second set was sent (Maple V 4.00a), it installed without difficulty, creating a nice folder on my desktop. The folder contained icons to the program (single- and multiprocessor versions), sample worksheets, a new user's tour, a conversion program for updating the code of worksheets from previous releases of Maple, and a *readme* and other documentation files. The new user's tour is quite good for seeing the power and some of the applications of Maple.

The Windows version, which works under Windows 3.1 (using Win32S 1.30), Windows 95, and Windows NT, is installed the same way and creates a similar folder to the one produced by the OS/2 version. I had no difficulty installing the Maple version under Windows 95, once I was able to successfully install Windows 95 itself.

New and improved

Previous releases of Maple have been basically command-line products. You would enter a command, such as one for solving an algebraic equation, and the results would be displayed on the next line (often in another color to distinguish it from the command). In Release 4, the command line has been vastly updated. Commands and solutions can be grouped into paragraphs or entire sections. These sections can be collapsed so that when you "read" a Maple worksheet, you can reduce the steps to only the basics. Comments can be added easily in multiple fonts and colors. Splashy headers and titles can make the worksheet more exciting. This is not your basic geek computer program.

Graphics are nicely incorporated into worksheets, and clicking on a graph presents a selection of icons for changing shading, coloring, graph type, and so on. Changing the direction that a three-dimensional graph is viewed can be performed interactively by rotating the viewing box. I found

the presentation excellent for adjusting and correcting the way my three-dimensional graphs were drawn.

But that's not all. Waterloo has built in the capability to hyperlink text or equations to other sections of the worksheet or other files, much like the linking on the Web. As a demonstration, the new user's tour is simply a collection of files with text and Maple code that are linked together with a table of contents.

**Comments can be
added easily in
multiple fonts and
colors. Splashy
headers and titles can
make the worksheet
more exciting. This is
not your basic geek
computer program.**

The help system works on the same principle. Using paragraphs, text, and example equations (and results), along with the hypertext linking, the help is useful and powerful. The only complaint I have is that sometimes it appears to be slow in loading the first help file.

Overall, the display is a vast improvement over previous releases and more intuitive than the organization techniques available for Mathematica. I found only one annoying problem with the initial release of Maple V for OS/2 Release 4: the fonts. The display fonts seemed to be too small. The size of the standard input, Courier 12, appeared to be about size 4. To make the input and standard output the size I would normally use (Helv 10 and 12), I had to double the font size.

Fortunately, Maple does come with a quick zoom button on the toolbar, except you have to remember to turn it off when printing. The text is printed with a very large font, otherwise. I was not alone; other users of the OS/2 version saw the same problem on other video displays.

I mentioned this problem to the technical support and apparently so did some others, because, in July, an update (Maple V Release 4.00b) appeared in the mail, which fixed the font problem. This update is evidence that Waterloo is serious about OS/2.

The Windows version is virtually identical in appearance and operation to the OS/2 version. I detected only some differences in fonts, but nothing dramatic.

Platform stability

With the exception of precision (that is, Maple's ability to produce the correct answer), people using these types of applications are often concerned about two characteristics of a mathematical package: its ability to solve a problem without crashing and its computational speed. If you read my review, "Mathematica for OS/2" (*OS/2 Magazine*, May 1996, pp. 70-72), I argued that while the appearance of the Windows version of Mathematica is superior, the overall stability of the product on the OS/2 platform, as well as its improved performance, makes the OS/2 version under OS/2 a better combination than the Windows version under Windows. My experience has been that Mathematica is unstable under Windows—a form of computational Russian roulette. Maple, on the other hand, has been quite stable under Windows.

The current release appears to be extremely stable under both OS/2 and Windows 95, making the weak link in the system the operating system itself. I was never able to crash the OS/2 version. Unlike Mathematica, the memory usage never produced 50MB swap files. In fact, the 20MB swap file rarely changed size.

A second machine was required for testing, because I was unable to install Windows 95 on the original test machine. While my version of Windows

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Table 1: Execution speeds of OS/2 Warp Connect and Windows 95 using Maple.

Calculation performed	OS/2	Windows 95
Calculate pi to 10000 places	17.5	23.7
Calculate 5001! to 100 places	5.30	6.45
Algebra: factor 100 equations	4.24	5.86
Simultaneous equations: 10 groups	9.36	16.1
Integration: 50 double integrals	12.9	18.4
Differentiation: 100 equations	1.52	1.90
Algebraic inverse of 25×25 matrix	7.13	9.14
Eigen values of 20×20 matrix	20.0	25.5
2-dimensional graphs (6)	1.67 (4)	2.488 (4)
3-dimensional graphs (5)	2.45 (14)	4.563 (11)

All times in seconds; a lower number is better. For graph tests, calculation and display times are given. (Actual tests are available from the author.)

95 crashes more frequently than OS/2, it has never reached the level of instability I have experienced with Mathematica under Windows 3.x. My experience is that Windows 95 is more stable than 3.x, but still less stable than OS/2 or UNIX. Hence, while testing the product, the operating system was the limiting factor in the stability of the execution. Your mileage may vary.

In general, I preferred to use the parallel-server version of Maple. This version allows you to work on multiple documents executing several operations simultaneously through the use of multiple threads across different processes. (Each document runs in a separate process.) The basic version does allow for multiple documents, but because only one thread exists within the single process, only one equation can be executed at any time within the program. The exception is that you can run an animation while equations are being evaluated.

Even when using the multiprocess version, Maple occasionally takes over the screen, sometimes displaying the OS/2 clock. This "waiting" occurs particularly when animations and plots are being rendered. Waterloo claims that this waiting is a result of both

the single input queue (SIQ) (see Tip 227 in "Tips & Tricks," April 1996, pp. 19-20 for a discussion of the SIQ) and the company's need to port the application to operating systems that do not support asynchronous threads.

When a command is sent down the SIQ and is being processed, other commands from other windows and applications must wait. Maple exposes the deficiency of the SIQ design of OS/2 when rendering a complicated graph, as the screen will sometimes freeze. While OS/2's FixPak 17 attempts to correct the problem, the result is not perfect. Because I have noted increased instabilities on my system after applying the FixPak, I chose to evaluate Maple without it.

The other cause of the waiting is inherent in the Maple design. The OS/2 programming guide may call for the creation of a separate thread when the execution is expected to require more than a fraction of a second. However, Maple, which must be ported to other, less robust operating systems, continues to execute on the primary thread. Watcom calls this a compromise. The parallel-server version improves upon the situation by executing the graphics in the primary thread, the kernel (where calculations

are performed) on a secondary thread and uses a tertiary thread for interprocess communication.

Watcom also had to compromise its WPS support by essentially ignoring it. Again, none of the other platforms on which Maple appears possess the richness of the WPS.

Finally, the parallel-server version was not always smooth in operation. When a particularly long calculation was performed in the background working with text in the foreground was occasionally jumpy. Amazingly the Windows version of the parallel server appeared snappier, but with a cost.

Speed, speed, speed

A series of tests was devised to compare the OS/2 and Windows version of Maple. These tests included both numeric and algebraic equations. Maple was tested for integration, differentiation, numerical calculation, algebraic manipulation, matrix manipulation, and graphing. And after numerous tests were performed, there was a clear performance champion for mathematical calculations: OS/2. And after numerous graphs were rendered, there was also a not-so-clear performance champion for graphics: Windows (Table 1).

In virtually every numerical calculation test I could generate, the OS/2 version returned an answer more quickly than the Windows version. The Windows version required as much as twice the time to calculate an answer. The difference between the OS/2 and Windows versions was more pronounced in Maple than in Mathematica.

This difference in speed was evident even in the graphics, where the calculations for the graphics were performed more quickly by the OS/2 version, but the graphs themselves were displayed more quickly by the Windows version. The video board used was a Matrox Millennium with 2MB, and the drivers used by Windows and OS/2 were written by Matrox. Because the calls to display the graphics are probably similar, OS/2 users are still held hostage to either slow graphics software in the operating system, or more likely, to less than

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optimal drivers. Again, your mileage may vary.

Serious about OS/2

Last year, IBM Corp. purchased Lotus Development Corp., and while Lotus might have been able to update SmartSuite for OS/2 at the same time it updated the Windows version, the reality is that after nearly one year, SmartSuite for OS/2 is a weaker, less useful product than its Windows sibling. This does not bode well.

However, when Waterloo released a major revision of its flagship product, the OS/2 version was released nearly simultaneously with the Windows version. Maple V Release 4 for OS/2 possesses all the features of the Windows version, sits on a more stable platform, and scores big in the most important department: execution speed. In short, Maple V for OS/2 is a winner, and Waterloo appears to be serious about OS/2.

As another indication of its com-

mitment to OS/2, in June, Waterloo Maple announced its support for OpenDoc. Waterloo's plan is to market its current and future products for mathematics as OpenDoc containers and parts. This approach would allow users to create documents that can incorporate the powerful Maple engine. Today, OpenDoc is available on Macintosh and OS/2 and will be available for Windows in the near future.

Professionals in need of a mathematical package are able to consider a number of powerful packages, including Maple, Mathematica, MathCad, and MATLAB. Combining ease of use, superb presentation and organization, a powerful engine, and a plethora of functions on a stable operating system, Maple V Release 4 for OS/2 is an excellent product. **OS/2**

Scot A.C. Gould is an assistant professor of physics at the Claremont Colleges spe-

cializing in atomic force microscopy. He has used and programmed under OS/2 since version 1.2. Scot can be reached at 70372.545@compuserve.com or at scot_gould@krupp.claremont.edu.

Resources:

Maple V for OS/2 (single edition, \$995; educational, \$695,)

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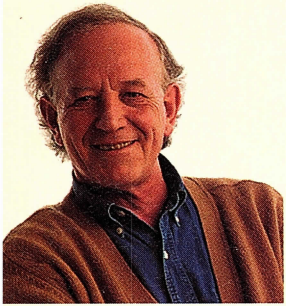


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Calling All OS/2 Administrators

BY STAN KELLY-BOOTLE

I'm still waiting for OS/2 Warp 4.0 and OS/2 Warp Server books to review. I'm sure they are on the way and may even be chasing me as I hop across Europe with a trail of volatile forwarding addresses. It will be interesting to see how the various publishers meet the challenge of updating their OS/2 titles to provide useful OS/2 Warp 4.0 and OS/2 Warp Server coverage. We've seen diverse strategies over the years as OS/2 1.0 progressed, via 2.1, Warp 3.0, and the related LAN Servers. The tactics range from simply sticking a decal on the front cover to a careful reworking of the material in light of the newly evolved version.

I use the word "evolved" with some trepidation. I'm writing this column during a rare dry spell in the gardens of Shrewsbury School, Shropshire, where Charles Darwin was educated. The great man looks down on me stonily, his statue dripping with the comments of the fittest of surviving pigeons. Whether operating systems conform to the Darwinian canon is a moot point. The sudden demise of DOS 4.0 confirms the hypothesis, but why did Univac's perfect Exec-8 fade away after a few promising years?

Meanwhile, Windows marches on, warts and all, so perhaps the analogy is misplaced. Biological species must adapt or die, but the weakest human code can endure with the help of big-dollar marketing.

Shrewsbury School boasts another "old boy," the bloody, hanging Judge Jeffries ("better that an hundred innocent should die than that one guilty should go free"), who may

appeal to the post-neo-Darwinism of Dawkins' "selfish gene." How sneakily selfish are the genes of the OS marketers? Guess who said "Part of what we're saying here at COMDEX [1989] is that we believe OS/2 is the platform of the '90s"? None other than the sneakily selfish William Gates.

The optimist, of course, assumes that there's been a run on OS/2 books, leaving all those Windows 95 titles unsold.

A visit to Whitestone's, Shrewsbury's best bookshop, revealed that the only OS/2 book in stock was *OS/2 Warp Administrator's Survival Guide* (SAMS Publishing, Indianapolis, Ind., ISBN 0-672-30744-8). A huge, eye-catching book, but, alas, the only OS/2 title on the shelves. (The optimist, of course, assumes that there's been a run on OS/2 books, leaving all those Windows 95 titles unsold.) A quick browse persuaded me to buy the book for just under 50 pounds sterling, even though it was published in October 1995.

The book follows the SAMS pattern established with *OS/2 2.11 Un-*

leashed, which I reviewed here in September 1994—and its best-selling successor *OS/2 Warp Unleashed*. SAMS has gathered together 19 OS/2 gurus, including many IBM employees with insider insights, to contribute one or more chapters on their particular areas of expertise. Coordinating the project editorially are Bret Curran and David Kerr, both veteran OS/2 practitioners.

As the title suggests, *OS/2 Warp Administrator's Survival Guide* breaks new ground in addressing the needs of those responsible for administering corporative OS/2-based networks and client/server systems. The sections on DB2 are particularly relevant. A CD-ROM is attached with all the usual evaluation, shareware, and freeware goodies. The edition I bought covers every aspect of OS/2 Warp Connect and AttachPak as of early 1996 with several forward-looking sections on the micro-kernel and the PowerPC that, alas, are already "inoperable."

Interestingly, the index has no entry for Java nor for any reference beginning with the letter J. However, I am convinced that SAMS will have another best-seller when it updates *OS/2 Warp Administrator's Survival Guide* to cover OS/2 Warp 4.0 and OS/2 Warp Server. 

Stan's latest book is *The Computer Contradictionary* (MIT Press). He welcomes e-mail via skb@crl.com. Try his Web page at <http://www.crl.com/~skb>.

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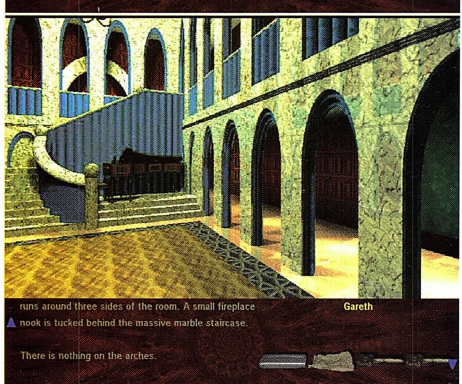
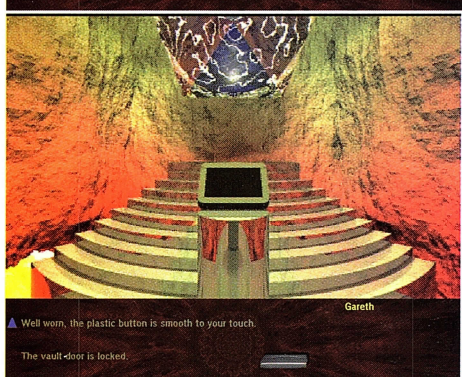
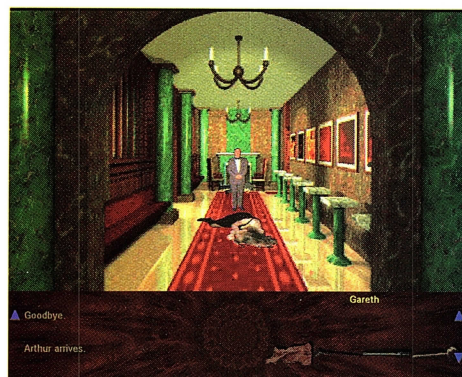
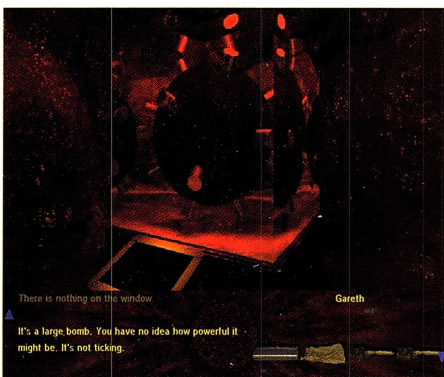
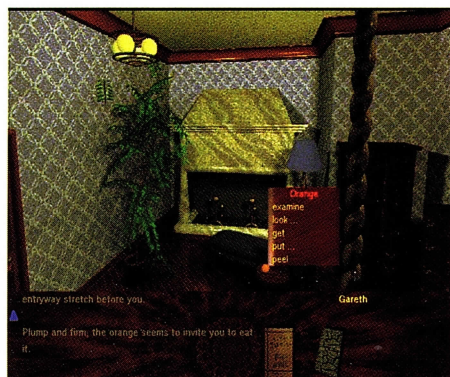
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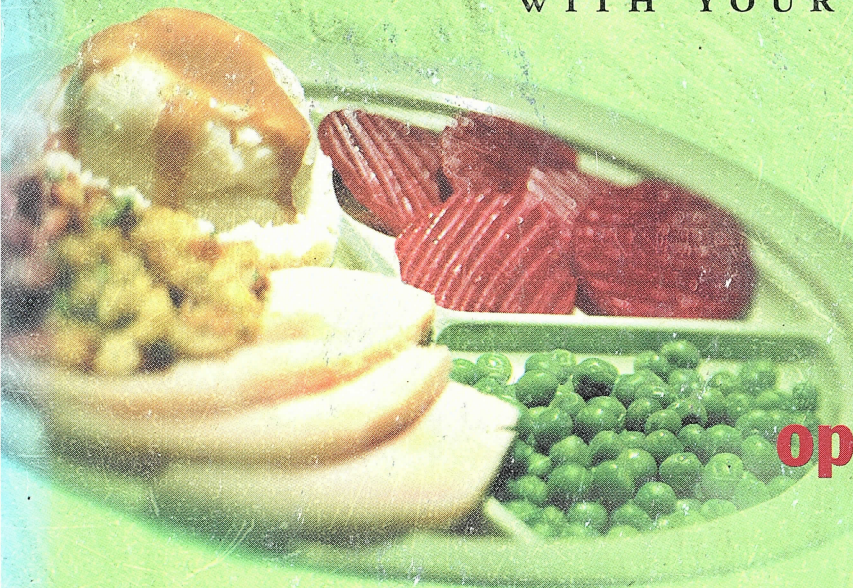


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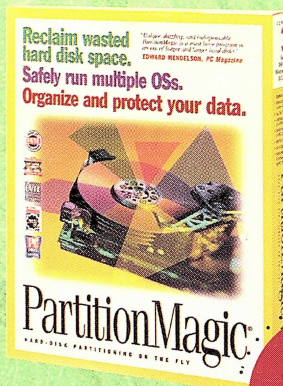
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